

COMPUTERWORLD

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Weekly Newspaper

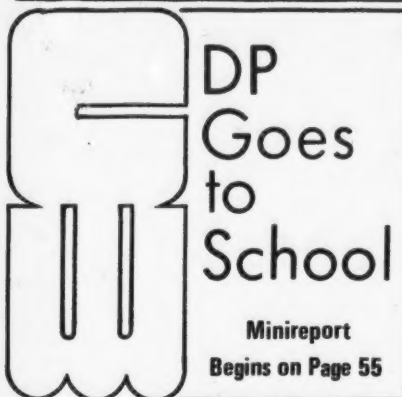
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Mitre Tells Air Force

6180 Has Best Security Potential

By Patrick Ward
Of the CW Staff

SPRINGFIELD, Va. — The Honeywell 6180 CPU is better able to provide a secure operating system than the Digital Equipment Corp. KI-10, IBM 370, Xerox Corp. Sigma 9 or Burroughs Corp. B6700, according to a report prepared for the Air Force by Mitre Corp.

The DEC KI-10 rated close to the Honeywell machine in being amenable to the user implementing a secure system, the report said. The 370 and Sigma 9, however, were both found "to be very difficult to use as bases for a secure system," and the B6700 would be an "extremely difficult" CPU around which to build a secure computing system, the report said.

Written by L. Smith and entitled "Architectures for Secure Computing Systems," the report made its judgments on the basis of how the architecture of the five machines compared with a list of 12 features Mitre feels would facilitate construction of a secure computer system.

"No existing system is secure from penetration attempts," the report said. This is true because no commercially available system has considered security as an absolute necessity but, rather, only as a desirable feature and also because of "the inability to prove the absence of bugs in a large system."

"Theoretically, a secure system could be implemented on any machine, but some architectural features are extremely important to effectively implement a secure operating system," the report noted.

The Mitre group came up with its list of desired architectural features both from a mathematical model of a secure system and from experience with nonsecure systems, the report noted.

Among the features are adequate access permission, variable and alterable access permission, continuous access checks, continuous space control, I/O access con-

trols and others.

Mitre then ranked each of the five machines on whether a particular architectural feature is available in hardware, is partially available in hardware or must be simulated in software.

The Honeywell machine had six of the features available in hardware, twice as many as its closest competitors, and tied with the DEC machine in having the fewest number of features that had to be simulated in software.

The report then went on to a detailed (Continued on Page 2)

Amdahl 470 Up to 130% Faster Than 2M-Byte 370/168 in Tests

By Patrick Ward
Of the CW Staff

ANN ARBOR, Mich. — A 2M-byte Amdahl 470 is performing various batch and on-line jobs 30% to 130% faster than a 2M-byte IBM 370/168 in tests at the University of Michigan Computing Center, according to Michael Alexander, senior systems research programmer there.

The Amdahl machine is halfway

through a free, two-month evaluation period [CW, July 2] and "looks good," Dr. Robert C.F. Bartels, the center's director, said.

The university will have to decide to return either the 168 or Amdahl 470 at the end of the 60-day test period, Alexander said.

"At this point it looks almost certain the 168 will go," he said, even though a 2M-byte 470 with its standard 16 channels costs somewhat more than a 2M-byte 168 with eight channels.

The center has set processing-time usage charges 50% higher for the Amdahl than the IBM machine to take account of the 470's greater speed, Bartels said.

As far as programmers can tell, the Amdahl 470 is a faster 168, Alexander said. For example, he explained, the 470 needs more time for long-precision, floating-point operations than short-precision ones, but both are "much faster" than either short or long precision on the 168.

The 470 is running under the Michigan Terminal System, a virtual operating (Continued on Page 4)

DP for Education Moves Out of Labs

By John Hebert
Of the CW Staff

The computer as an educational tool has progressed from a position of relative mystery in the research centers and science laboratories of the 1950s to a fairly commonplace status in many U.S. high schools and most universities.

With the experience of nearly two decades under its belt, computer use in educational settings is only now advancing at a modest rate.

Last year, approximately 58% of all secondary schools in the country accessed a computer for administrative or instructional purposes, according to the results of a study of computer applications in secondary education conducted by the American Institutes of Research (AIR) (Continued on Page 4)

In Tarheel Triumph

Small Shop Builds Programming Palace

By Don Leavitt
Of the CW Staff

GREENSBORO, N.C. — Many IBM installations have enjoyed the benefits of interactive program development, of source program and procedure library support, of spooling printer output to disk and of accumulating job-accounting statistics.

To have all these facilities at once, however, DP shops usually have been big OS operations running under TSO or using a lot of independent software packages which the users had to interface once they were brought in-house.

But not at Carolina Steel Corp. here, which has an integrated on-line programming support system with all those features. The software was built in-house by programming manager Charles Rice and consultant Don Stoneman and runs on a 144K IBM 370/135 under DOS/VS.

Utilizing the system, a programmer can code, compile and test a program from a CRT terminal. The compiler listings are available at the terminal so the entire cycle, from coding to working program, can be completed in one sitting, noted Harry T. Parrish, Carolina Steel's manager of information services.

Parrish has a staff of six programmers sharing three IBM 3270s and the units are usually busy. The on-line programming support is operational at the same time as three batch partitions, the spooling capability and servicing of application work coming in from four CRTs located in user

departments within the corporation's headquarters.

Developed over 18 months, the system has had two basic, obviously related benefits. Programmer productivity — most of the application programs are written in PL/I — has more than doubled, the manager noted, adding "this alone will pay for the development cost during the first year" of use.

Second, and more important in Parrish's view, has been the reduction in time his staff takes meeting user requests. "This has been a tremendous help in improving relationships with user departments," he said.

The system's support allows the programmer to create completely new programs or to modify source code already stored on the disk file. Pages of instructions can be skimmed on the CRT until the programmer reaches the place where changes are to be made. Immediately after changes are completed, the revised program can be compiled.

Utilizing the spooler facility, however, early compilations need not generate massive hard-copy listings just to get the inevitable diagnostic messages. Instead, the spooled listing can be directed to the programmer's CRT where problems can be reviewed and — hopefully — corrected.

When all errors have apparently been fixed, recompilation can be triggered, with that listing checked out on the CRT. And so the cycle can continue until the compilation is clean.

With the system's procedure library capability, the programmer can create Job Control Language (JCL) statements to test the newly compiled program or modify JCL already stored for a program that has reached production status.

Conditional parameters determine (Continued on Page 2)

Users Who Ended Contracts Say Honeywell Tried to Take Specs

By Nancy French
Of the CW Staff

ST. LOUIS — Two users here have reported Honeywell service personnel attempted to remove wiring diagrams and related maintenance documentation from their computer centers in apparent retaliation for cancellation of maintenance contracts.

The users who reported the incidents said they came as a complete surprise. They had always believed things such as wiring diagrams belonged to them as owners of the systems, and Honeywell had never informed them otherwise.

Now Honeywell's St. Louis district service manager is contending they are the property of Honeywell and must be surrendered to the vendor after service contracts are terminated, the users said.

Lou Fox, vice-president of Emco Com-

puter Services, a subsidiary of Elder Manufacturing Co., and Ron Fehr, DP manager at Pevely Dairy, reported similar experiences.

Fox said about two and one half months before the incident occurred, he canceled his Honeywell maintenance contract.

"It was strictly a cost decision," he said. "Honeywell was getting too expensive" and Raytheon Service Co. had offered him a better price.

Fox, in keeping with his agreement with Honeywell, gave Honeywell 90 days' notice of his intentions, he said.

One week before the termination date of his contract, two Honeywell employees came to his installation. One distracted him in his office while the second tried to remove the documents, he said. (Continued on Page 3)



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In Supreme Court Filing

IBM Says Telex Case Unworthy of Review

By E. Drake Lundell Jr.
Of the CW Staff

WASHINGTON, D.C. — The Telex case "raises no issue worthy of review" by the Supreme Court, IBM declared last week in a filing with that court.

In the filing, IBM basically supported the decision of the appeals court, which found IBM not guilty of monopolization, while attacking the Telex filing to the Supreme Court.

The appeals court decision [CW, Feb. 5], IBM said, "is clearly correct. Moreover, if either of its two basic rulings is valid, its antitrust judgment must stand."

First IBM supported the appeals court contention that the market had to be defined more broadly than it was by the

district court, which initially handed down a judgment against IBM.

The appeals court "correctly concluded" that "IBM was subject to a far broader range of competition than that embraced by the district court's relevant market definition," IBM said. "That decision is correct and is not in conflict with the decision of any other federal court."

Furthermore, "the court of appeals' decision corrected a novel and dangerous misuse of the Sherman Act," IBM said. "By combining condemnation of ordinary competition in the form of new products and optional short-term leases with an artificially narrow market definition framed in terms of the products of a single company and copies thereof, the

district court opened the door to unjustified treble damage litigation which would suppress ordinary competition and flood the federal courts with groundless claims of monopolization," IBM added.

In addition, IBM claimed the appeals court finding that the firm had not engaged in predatory practices was also clearly correct.

"No federal court has ever suggested, much less held, that the introduction of new products and optional one- and two-year leases constituted a violation" of the antitrust laws, IBM said.

In fact, the purpose of those laws is "to encourage, not suppress, competition on the merits, such as the introduction of new products and new options in terms of trade," the IBM statement said.

The Telex appeal to the Supreme Court, IBM said, "has sought to argue its cause by repudiating the findings of the district court."

"In its petition [to be heard by the Supreme Court], Telex ignores the district court's findings against it and patches together a series of magazine articles, speeches and other nonrecord sources into a statement of 'facts' which is... wholly inconsistent with the record and findings" of the other courts, IBM said.

Small Site Now Program Palace

(Continued from Page 1)

which JCL statements apply if, for example, a program has to be able to run in either of two or more partitions.

Finally, the system permits the programmer to make "patches" in the machine-level code while the program is running. This comes very close to the console debugging practiced by programmers on earlier machines.

Once a change to a running program has been tested "live" through the patching facility, the programmer knows it will work and can make the corresponding change in the program's source code, Parrish noted.

Aids Management

Even while the system is providing programmers all these facilities, it is also accumulating accounting statistics for management including, for example, a daily transaction summary by partition.

This particular report covers such things as number of jobs and number of Abends, CPU time, I/O counts, phases and transi-

ents loaded and page fault statistics.

Other reports — which can be called up on the manager's CRT anytime — show data more specifically keyed to programmer productivity — who has done how many compiles and the like.

With information like that easily available, Parrish can keep tabs on his crew without being obvious and may be able to spot a project that's in trouble even before the programmer recognizes the fact.

Mitre Praises 6180 for Security

(Continued from Page 1)

commentary on how each of the machines matched up with the desirable security features.

While the B6700 "has many pleasing architectural features that are desirable to implement a secure system," it also has serious weaknesses, the report noted.

As for the 370, "the two major problems... are lack of adequate access variations and the availability of only two execution domains," the report said.

"These two features are the ones that security relies most heavily upon, making the 370 architecture one of the most difficult upon which to implement a truly secure computing system," the report stated.

"Architectures for Secure Computing Systems" is report number AD-A009 221, available for \$4.00 from the National Technical Information Service, U.S. Department of Commerce, Springfield, Va. 22151.

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Users Report Honeywell Attempts to Repossess Specs

(Continued from Page 1)

"I was talking with one Honeywell fellow in my office and one of my operators came in and said another guy was out on the floor trying to take out our wiring diagrams. I told him to stop him."

Amid this confusion, Fox said, "I got a phone call from an employee at my other installation who said the same thing was going on there, and he asked me what he should do. I told him to stop the guys, but it was too late. The Honeywell engineers had gotten out of the building with the documents."

Fox's attorney has contacted Honeywell's St. Louis district service manager to instruct him to return the documents, but at press time they had not been returned.

"As far as I'm concerned those materials belong to me," Fox said. "They came with the machine and they stay with the machine."

"What really bothers me about this whole thing is [Honeywell] never wrote me a letter or came in and said I had to get my own wiring diagrams. It just came in and stole them," he said.

"How can a company that has a salesman in here trying to sell me a new system stoop so low as to do a thing like that? As far as I'm concerned, forget Honeywell," he said.

Ron Fehr, at Pevely, described the incident in his installation similarly. In his case, however, no documents were lost.

As Fehr told it, he had never had a maintenance contract with Honeywell, but had arranged for preventive maintenance service every fourth Wednesday morning, when the installation was almost down anyway. The dairy had been paying about \$60 per hour for this service with a two-hour minimum, Fehr said.

Pevely had decided to handle maintenance this way when its first H-200 was installed in 1966, and it had been a good decision, Fehr said.

"About two months ago, on a Wednesday morning, a Honeywell engineer came in. I hadn't called him, but thought one of my operators had, which would have been all right," he said.

"During the course of conversation he told me no one had called, but that he heard we signed a maintenance contract with Raytheon Service Co. and he was there to pick up my wiring manuals," Fehr said.

"I told him then that I was going to stop him if he tried to take them, and he could just call his boss and tell him that." The engineer left without the manuals, Fehr said.

"Then on Friday, the engineering manager and the sales manager of Honeywell's St. Louis branch office came out to talk about it and I told them that if they wanted the manuals, they would have to take them by force. Then I told them I would call the police. They haven't come back since," he said, but added something

else did happen.

About two weeks later, on the Wednesday morning when Fehr expected Honeywell field engineering in for preventive maintenance, no one showed up. "About 10 o'clock I called the response center — the 800 number — to find out what happened and was referred to the St. Louis district office."

"The engineering manager informed me I couldn't get service through the regular channels anymore, and that I had to be handled through his office on a special basis."

"The thing that got me mad about that was that his personal services are not available 24 hours a day or on weekends when I might need them," he said.

Since this difficulty occurred, Fehr said he has been depending on Raytheon for service on a per-call basis and has had no difficulties.

Fehr still has his wiring diagrams, he said.

Telephone calls to other Honeywell users in other locations indicated no other installations had experienced any difficulty over wiring diagrams.

Spokesmen from Burroughs and IBM confirmed that maintenance manuals, wiring diagrams and the like go along with their systems and are the property of the owner of the system.

According to Honeywell policy, a Honeywell spokeswoman said, maintenance manuals, operations manuals and instruction manuals are furnished with the systems and are the property of each customer.

However, "Honeywell owns all manuals which contain wiring diagrams and manuals on the theory of maintenance," she said.

She disputed the contentions of both

Fox and Fehr, saying "Honeywell personnel did not attempt to steal any documentation."

According to information provided to her, there was no attempt to divert the DP manager at Emco-Elder. Engineers went to the site for the specific purpose of discussing the matter of the wiring documents, she explained.

"They left without the manuals when Fox threatened to call the police because they didn't want to make more of the matter than had already been made," she said.

Engineers did take the documentation from the second Emco site, where the computer was purchased under a contract which gave no rights to customers to retain documentation.

"Without a maintenance contract, the firm couldn't be allowed to retain the wiring diagrams," she said.

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Court Denies Request To Delay Xerox Sale

WASHINGTON, D.C. — Judge June Green has denied the injunction sought by John C. McWilliams and Associates, Inc. (JMA) to delay the sale of Xerox Corp.'s Data Systems Division [CW, Aug. 27].

JMA asked for the injunction to ensure that Xerox made adequate provisions to honor its contract with the Church of the Seventh Day Adventists here.

JMA still intends to file suit against Xerox, according to its attorney, Douglas J. Rykhus. JMA contends Xerox failed to modify standard software and provide test time as promised and technical support, Rykhus said. The church contracted JMA as a systems integrator of the Sigma 9 and 560 it ordered from Xerox.

After Two Decades in Lab, CBE Making March Forward

(Continued from Page 1)
and funded by the National Science Foundation (NSF) [CW, Aug. 20].

Insofar as instruction is concerned, use of the computer in secondary education was found in 21.8% of all schools surveyed by AIR.

At the college and university level, computer-based education (CBE) — an encompassing definition of computers used to supplement or provide the basis for educational instruction — is "very widespread," according to Martin Rubin, a research scientist at Human Resources Research Organization (Humrro), and co-author of *Learning Alternatives in U.S. Education: Where Student and Computer Meet*.

Although updated figures of incidence rates in higher education are unavailable (no study has been undertaken since 1970), the instructional use of computers

is "really a blossoming field that's working its way down the educational ladder," Rubin stressed.

Dr. Alfred Bork, chairman of the Association of Computing Machinery's Special Interest Group on Computers in Education (SigCue) and professor of physics and information and computer sciences at the University of California at Irvine, agreed there has been "impressive growth" in the educational use of computer systems, considering the problems in dealing with an application area as complex as education.

"It's spreading rapidly enough, but to create and use material is a slow process. I'm not worried about the [modest] rate — the relatively slow pace is only natural. There's a tremendous amount to learn," Bork admitted.

"The extent of [computer] use will ultimately be determined by judgments

of appropriateness by subject experts, effectiveness observed from records of student performance and costs which must be met . . . by the schools," according to Karl Zinn, a research scientist and associate director of the Merit computing network at the University of Michigan.

The major problem shared at all educational levels is one of cost, even though it is well known, as Zinn stated, that "computing costs are decreasing even while capabilities are increasing."

At the level of secondary education, according to the AIR report, "the future of instructional computing is intimately related to the resolution of problems involving system costs, the exchange of information, utilization of available resources and individual and institutional receptivity to innovation."

Present limitations imposed by current computer technology at the university level, according to Zinn, "are the unreliability of processing lengthy verbal constructions and the inability to interpret bodily gestures or vocal intonation."

"But one of the most difficult problems

remaining is lack of organization of the subject matter," Zinn stated.

Resources Not Utilized

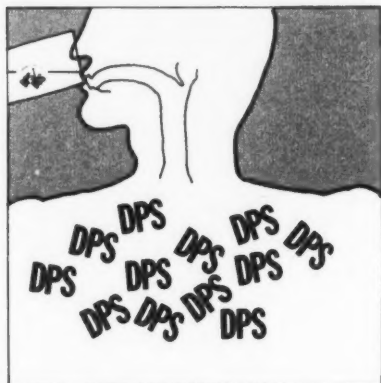
But in U.S. public secondary schools, that problem is not at the forefront because of the small amount of time schools have had computing power.

"Out of the 1,459 individual computer-based courses listed by respondents, 43.2% were in mathematics. Obviously, there has been no major breakthrough of instructional computer applications into other than the more traditional math-oriented subjects," the AIR report found.

A major problem, then, is to use the resources now available. "The technological capability is here, it needs to be used," according to Karen Duncan, director of the office of computer resources at the College of Dental Medicine of the Medical University of South Carolina.

"The psychology of getting school faculties to author course programs is the next breakthrough that has to come in [computer-aided education]," Duncan explained.

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470 Testing Faster Than 370/168

(Continued from Page 1)

system which the computing center originally designed for an IBM 370/67 and now uses on its 168.

Installing this operating system on the IBM-compatible Amdahl 470 took about two man-months with no discontinuity for the center's users. The only significant problem arose in converting the error-recovery aspect of the operating system, but that was not a major roadblock, Bartels said.

If the university had switched to a Burroughs or Control Data Corp. machine, the conversion effort probably would have cost about \$2 million dollars, Bartels said.

The 470 currently offers Fortran G and H, Watfave and PL/I as well as Algol, Snobol, Basic, Assembly, APL and several others, he said.

The computing center expects "no problem" in interfacing either new IBM hardware or software products to the 470, Bartels added.

"We are looking forward to attaching IBM 3350-compatible fixed-disk drives to

the 470 next year," he said.

So far, the university has had no more trouble interfacing its IBM-compatible peripherals to the Amdahl 470 than it had linking them to the IBM machine, Alexander said.

The Amdahl system provides the maintenance engineer with considerably more information on the internal state of the machine, he added. However, this information is not particularly useful to the user interested in computer performance evaluation, he said.

The 470's communications-handling ability is "no better or worse" than the 168's, except that the Amdahl system comes with 16 standard channels, he noted.

As yet, the university cannot fully utilize the additional power of the 470 because of a lack of memory due to a heavy paging load, Alexander said.

The university brought in the 470 knowing the 2M-byte capacity was insufficient for its range of applications, but "fully expects to go up to 4M bytes in a few years," he added.

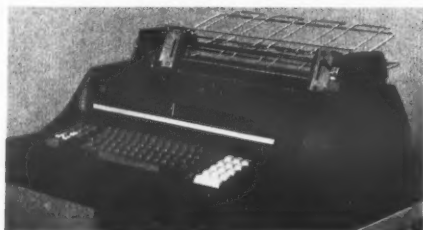
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Exhibit Crowd-Pleaser for 10,000

By E. Drake Lundell Jr.
Of the CW Staff

TOKYO — Exhibitors and attendees alike were pleased with the exhibition in connection with the recent Second U.S.-Japan Computer Conference here.

More than 10,000 people visited the crowded exhibit area in the Tokyo Prince Hotel, with 1,000 of them registered for the full program of exhibits and seminars.

The quality of the exhibit attendees was kept high by a stiff exhibit entry fee, according to Ted Lorber of California Computer Products, Inc., (Calcomp) who was in charge of the exhibit part of the program.

Because of the high exhibit-only fee (about \$100), the attendees were highly qualified and not the general public, he indicated.

And the reaction of the exhibitors seems to bear out that contention.

At Basic IV, for example, President Al Constantinas said the firm was seeing highly qualified contacts, even though it had not yet signed a marketing agreement in Japan.

"Japan is the one area of the world where we are not active at the present," he said. But because of the reaction from the attendees at the show, he indicated the firm would soon sign a marketing agreement with a Japanese trading company or manufacturing firm to market the firm's small business system there.

Calcomp also used the show to help launch several disk products into the Japanese market and indicated that prospects at the show showed particular interest in the Trident floppy disk system as well as larger disk units on display for OEM sale.

At Tally, which has been marketing its printers in Japan for some time, Robert Maddy, international marketing liaison director, said response at the show had been "tremendous" and the firm could expect some sales directly from its participation.

At the same time, the mainframe makers, which included IBM Japan and NCR plus the homegrown Fujitsu and Hitachi, packed attendees into their constantly crowded booths with demonstrations mostly of peripheral gear.

While there were some products on display for end users, primarily from the mainframe makers, most of the equipment on display was directed at OEMs, particularly by the U.S. firms that hope to crack the Japanese market by having their units integrated into other sys-

tems that would be marketed and maintained by Japanese firms.

"We really can't afford to have a maintenance operation here,"

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one explained. "But the market is growing so fast we don't want to be left out of the action."

At the same time, there was

little on display that would be considered new to U.S. audiences.

The minicomputer revolution was also largely absent from the displays. No large U.S. minicomputers, with the exception of Basic IV, participated and few Japanese firms emphasized mini products.

"The full-scale, large mainframe is apparently still the way to go here," one U.S. marketing man said. "But that will probably change in a year or so."



Interdata's 7/32 mini proves of interest to exhibit attendees.

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System Design Must Account for Public Attitudes

By E. Drake Lundell Jr.

Of the CW Staff

TOKYO — The attitudes of the public at large and the impact of automation on society must be "taken into account" when designing new systems, Dr. Lewis M. Branscomb said at the Second U.S.-Japan Computer Conference here recently.

"Research in computer science and technology must ultimately relate to the well-being of the societies in which we live," Branscomb, IBM's vice-president for research, told the 1,000 attendees at the meeting.

At the same time, computer science draws on many different disciplines and many of the "really promising" ideas in the field arise "unexpectedly from the fields of basic science," Branscomb said.

Therefore, "it is important to recognize how much computer science draws on these disciplines and to emphasize the importance of keeping computer science and the industry it supports open to new ideas and in a position to stimulate these ideas," Branscomb added.

Furthermore, as the complexity of the man-machine interface continues to grow in computer systems, the number of basic science fields that have to be considered by the computer scientists will also grow, Branscomb said.

"Thus every effort should be made to keep the community of computer science and technology researchers in good contact with their colleagues in other disciplines," he added.

Nature of Systems

With the exploding growth of new technologies, their application has to be guided by systems considerations which should lead toward more research on the nature of systems, he said.

"In the past, the rate of progress in semiconductor device technology has been so great that research projects on new system architectures have been in danger of obsolescence on economic or technological grounds before they have had a chance to mature," he stated.

The proper choice of architectures, however, "is essential because these architectures must be guided by increasingly complex applications environments," he said.

Therefore there is a need to devote research time and effort to looking beyond the immediate impact of these new technologies and to inquiring about their "ultimate limitations," Branscomb said.

"We must ask ourselves — putting economics aside for the moment — what ultimate limitation do the laws of physics and chemistry place on continued progress in the present state-of-the-art in a given area?"

"Then for each of the promising radical alternatives to today's technology, we should ask a similar question: Does this idea have the potential of ultimately being far superior to today's technology?" Branscomb said.

In this way, scientists will avoid putting too much effort into the development of technologies that do not have great ultimate potential and "which are likely to be made obsolete before they mature," he said.

Over the past 25 years, improvement in performance has averaged around 40% annually in computer systems, Branscomb said, noting that "in this circumstance, it is well to look as far ahead as we can in making technical choices."

Consideration for Users

Another element in the strategy for research in the computer field is to be guided by the user's point of view, according to Branscomb.

"Indeed, when we think about the economics of computing, we must think of the user's total cost, not simply those attributed to his data processing installa-

tion," he said.

"As information-processing technology matures, the user will be more and more interested in the ease with which new applications can be developed, installed

CW at U.S. - Japan

and upgraded, in system availability and reliability, in recovery after failure and in the reduction of complexity with which he must contend," he predicted.

Therefore the technology of terminals will become extremely important, Branscomb said, as will the techniques needed to make the system transparent to the ultimate user.

The complexity of systems and their

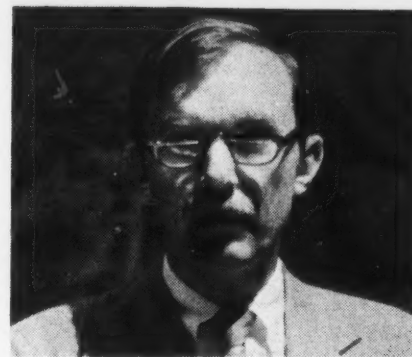
scope will have to be balanced against the ease of use of the system, he said.

Computer scientists will also have to get involved with behavioral questions in the future, Branscomb said.

"If information systems of the future are to adapt to people and to human institutions rather than continuing to force people to adapt to machines, then systems architecture and the man-machine interface must be understood in their human dimensions," he said.

So far the "behavioral aspects of information science have not yielded to any significant research progress," he said.

"Nevertheless, computer scientists cannot avoid what are ultimately behavioral questions; they show up in the design of data structures, in the engineering of a storage hierarchy, in the specification of the speed and size of cache memory, in the allocation of resource control in a computer network," he said.



Dr. Lewis M. Branscomb

"The scope and difficulty of these issues on the 'people frontier' goes far beyond what is conventionally meant by 'human factors.' They offer the ultimate challenge to computer science research," Branscomb concluded.

"Impartial judgments are confirming our own analysis — we have a Mass Storage System that outperforms the 3850 by a significant margin"

An interview with Arthur Hausman, President of Ampex Corporation

Q. Mr. Hausman, what's so new about the Ampex TBM Mass Storage System?

A. The TBM Mass Storage System isn't being announced as a "new product." We delivered our first system in July of 1972. It's been a very successful installation with better than 98% uptime.

Q. Then why haven't we heard more about the Ampex Mass Storage System until just recently?

A. We had two very good reasons for biding our time. First, we wanted to evaluate and test our first installed system under actual field conditions. This system has demonstrated high reliability and superior performance. Our second reason for waiting was related to market conditions. Now we think mass storage has reached maturity. IBM's announcement of the 3850 Mass Storage System has confirmed our judgment that the time is ripe for MSS.

Q. How does IBM's announcement of the 3850 Mass Storage System affect Ampex's position in the mass storage market?

A. Quite frankly, we are elated that IBM has joined us in the market. Interest in MSS technology has skyrocketed since they announced the 3850. IBM users are evaluating the performance of both the Ampex and the IBM systems. And from what we hear, the impartial judgments are confirming our own analysis—we have a system that outperforms the 3850 by a significant margin.

Q. Can you compare the two systems?

A. I'm not sure. IBM designed the 3850 to serve a very specific segment of their own equipment users. The 3850 is designed for a batch environment, operating under OS/VS. If you're in that category, you're a potential customer.

On the other hand, the Ampex TBM Mass Storage System satisfies a much broader range of user situations, such as interactive, OS/MVT and multi-host environments containing both IBM and non-IBM mainframes. TBM Mass Storage System users have a much wider range of operational and growth options.

Q. Speaking of other mainframes, how will those manufacturers meet the IBM challenge in the area of mass storage?

A. We hope they'll do it with the Ampex TBM Mass Storage System. We feel we offer OEMs better performance and field-proven hardware, which could place them ahead of the competition.

Q. What about interfacing the TBM Mass Storage System to other mainframes?

A. We have interfaces for CDC, DEC and IBM 360 and 370 OS/MVT. Others are under development.

Q. Let's talk about reliability and performance, since they seem to go hand-in-hand. Can you capsule the Ampex claims?

A. Reliability is a combination of our technology and our field experience. The TBM Mass Storage System uses a technology based on Ampex equipment that has been in the field for 19 years. In all that time, nobody has developed a better recording technology. The performance of the TBM Mass Storage System is the result of eleven years of MSS experience. Our mass storage people are experts.

Q. The word flexibility keeps coming up in these discussions. What does it mean in relationship to a potential user of a TBM Mass Storage System?

A. The TBM Mass Storage System is extremely modular. Basic capacity is 11 billion bytes on-line, and it can be expanded in increments of 11 billion bytes as required by the user. You can begin with fairly modest I/O capacity and some basic access times, and build to just about any performance rating you need. The competition only offers an incremental package of 67 billion bytes plus additional I/O channels every time the system is expanded. The cost is substantial.

Q. Who qualifies as a prospect for mass storage systems?

A. Anybody with large off-line computer tape libraries and a lot of on-line disk drives. The TBM Mass Storage System puts the tape library on-line and substantially reduces the number of disk drives required to support the CPUs.

Q. The idea of having your data base on-line is exciting. But is it cost-justified?

A. The labor for human intervention—mounting and demounting computer

tapes—is costly. Delays in processing and job scheduling on the CPU are very important determinants in efficiently utilizing CPU time. Storing a million bytes on-line with a 3330 type disk drive costs approximately \$6.50 per month; storing the same data on mass storage costs about 50¢ a month.

Q. Doesn't the integration of a mass storage system into a customer's operation imply substantial software modifications?

A. The Ampex TBM Mass Storage System was the first to offer disk staging and destaging of data from the mass storage system to the host computer. The IBM 3850 utilizes the same technique. Our user transparent interface makes the TBM Mass Storage System appear to the host computer as an infinite number of on-line 3330 type disk drives.

Q. What is your opinion regarding the future of mass storage systems?

A. We know there is a substantial market for on-line mass storage systems. Off-line tape and disk libraries are incongruous with the power available in today's computers. We believe that thousands of mass storage systems will be installed during the next several years. Those projections are substantiated by the number of 3850s which IBM has been reliably reported to have on order. Ampex is confident that the TBM Mass Storage System will gain a respectable share of this growing market.

Thank you, Mr. Hausman.

(Your letterhead inquiry will be answered with a free copy of our brochure titled *TBM The Ampex Mass Storage System*. It's important reading for executives with data processing responsibilities).

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But Not as General-Purpose Robots

Process-Control Systems to Bring Major Cost Savings

By Edward J. Bride
Of the CW Staff

TOKYO — While there may be no such thing as a general-purpose robot, the state of the art in programmable process-control systems, including visual parts inspection, is about to bring major labor cost savings to industry.

This was the consensus of speakers at several different sessions oriented toward industrial automation, pattern recognition and artificial intelligence during the recent Second U.S.A.-Japan Computer Conference here.

The goal of some of this research in these fields is to do a better job than human beings in such complicated areas as designing earthquake-proof buildings and automating traffic flow.

But a spin-off benefit has been reduc-

tions in work forces during a period of worldwide inflation and unemployment, though the employment picture is less severe here than in much of the rest of the world, according to speakers.

An "upgrading of manpower use," rather than replacing people, was the result of installing a digital computer to control three batch reactors used to produce lubricating oil additives.

As described by Glen R. Nieman of Fisher Controls Co., the system improved product quality, eliminated waste and brought higher productivity than older methods of manually adjusting temperatures or having humans decide on the proper time to add raw materials and control pressure in these batch reactors.

"An additional benefit," said Nieman, was the release of head operator time

which was previously used to back up a busy operator.

Gaining Wide Acceptance

Generalizing on the results of several case studies in industrial control, Nieman said computer-based process control systems are gaining "wide acceptance in

CW at U.S. - Japan

industry." He credited several factors for this gain: improvements in computer performance, reliability and ease of programming, coupled with reduced hardware costs.

He also claimed computer controls in such industries as pulp and paper and ammonia plants are "becoming a routine matter," with resultant improved efficiencies and pay-out periods which are commonly "less than a year."

Looking more to the future, representatives of the Stanford Research Institute's Industrial Automation Project said many techniques for visual inspection — combining cameras and computers — "are ready for cost-effective factory applications."

These techniques would be used both for parts recognition to assemble parts for assembly lines (separating them from common conveyor belts, for example) and for inspection to remove rejected parts from such conveyors.

A large, time-shared Digital Equipment Corp. Decsystem-10 was used to develop digitizing algorithms to perform such inspections as assuring the proper placement of holes in lamp bases, the sizes of holes in piston connecting rods and the location of handles on various parts to facilitate robotic movement of these parts.

While a large computer was used to develop these algorithms, they can actually be run on a PDP-11 mini with 28K of 16-bit core memory, according to researchers Gerald J. Agin and Richard O. Duda.

They noted in defining a "standard material-handling problem," such as the acquisition of parts from a moving conveyor belt that, if the "identity, location and orientation of a part are all accurately known," a manipulator "can be programmed to acquire the part without the need for sensory feedback."

However, maintaining this control is expensive, and "the versatility of an industrial robot can be greatly increased by adding visual sensing."

In using a camera placed over the belt and in using their algorithms, the amount of additional work which may properly be called "programming" is "fairly small," they said.

Their display-based interactive methods for designing and reprogramming the vision system require "significant computer facilities" only during the design phase, they said.

The resulting procedures, they continued, can be executed on minis, proving "indispensable in introducing these methods into the factory."

In a separate panel session, Agin cited the benefits of such artificial intelligence research, noting there are important social implications for workers in the factory.

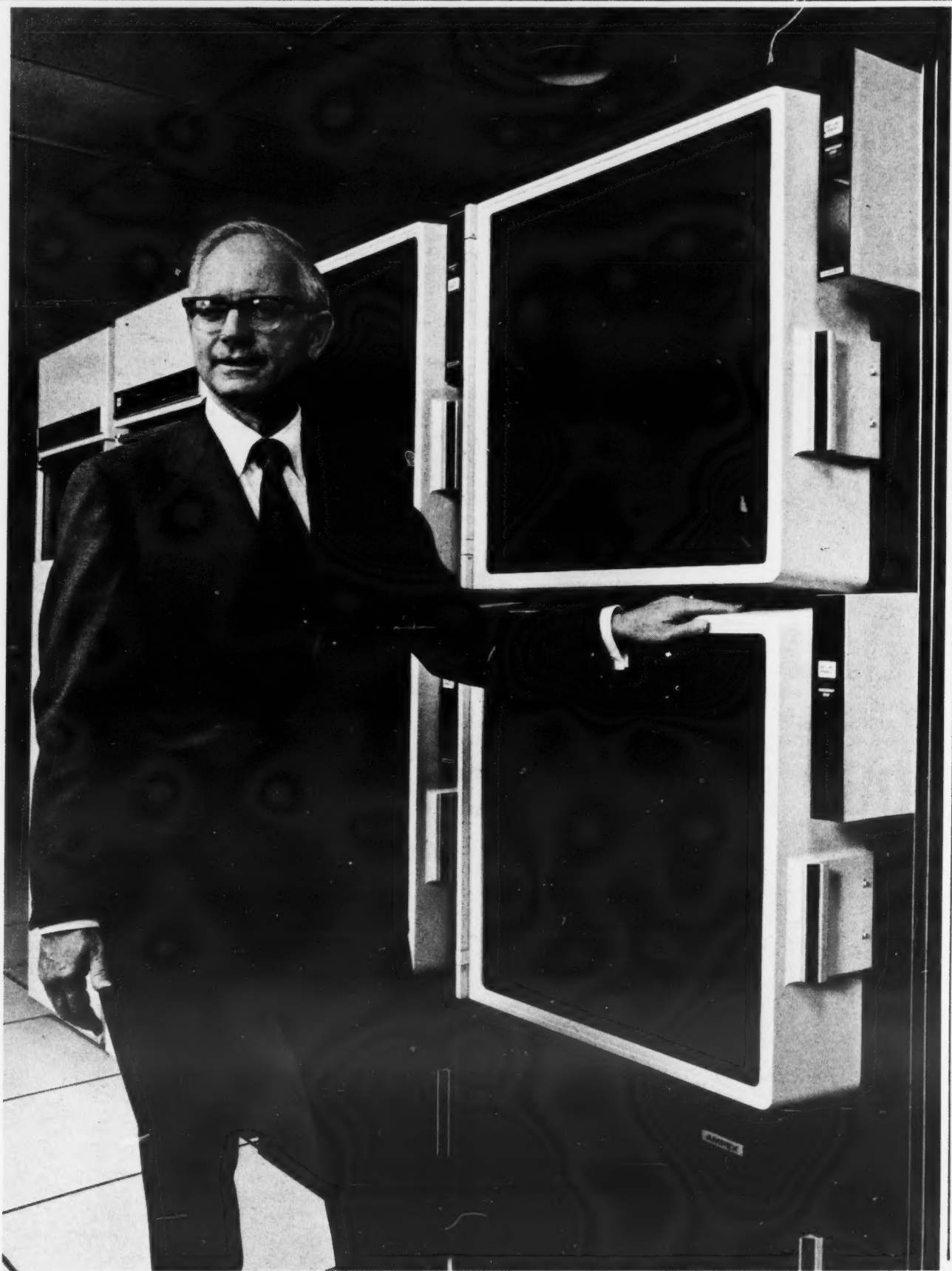
"Industrial manipulators," he said, can work "in hostile or unsafe environments, lowering accident rates and health problems." They can take over "dull, repetitive assembly line work," he continued, "freeing workers to operate, train and maintain the machines."

Furthermore, rather than eliminating jobs, he said, artificial intelligence in industrial applications "can permit the same number of workers to produce a better quality product."

Meir Weinstein, of the California Institute of Technology, commented that there is no such thing as a "general-purpose robot," and even when the intent is to construct a machine which can learn about its environment, this will result in performing a specific task.

In a paper on "graceful degradation" of the traffic control system on Osaka, Japan, Toshiharu Hasegawa of Kyoto University cited the need for operator training as well as hardware trade-offs.

In the latter case, for example, he noted that the mean time between failures can be less important if the mean time to repair is very short.



Will Improve Human Knowledge

DP Seen Important Tool in Building Future Society

By E. Drake Lundell Jr.

Of the CW Staff

TOKYO — "Information technology will be an indispensable factor in contriving the post-industrial society to come," Bunichi Oguchi said at the Second U.S.A.-Japan Computer Conference here.

At the same time, information technology will be a powerful tool "to rationalize industrial operations and services" to construct an active and wealthy society, according to Oguchi, who is director of the Research Bureau at Nippon Telegraph and Telephone Corp.

The most prominent feature of postindustrial society will be that it is based on service industries, Oguchi said, such as com-

merce, trade, finance, transportation, recreation, health care, education and research.

The quality of that society will be evaluated by the available services and the amenity of life and not just by the production capacity of that society.

"Further, the growth of the postindustrial society will be governed through planning and forecasts, based on theoretical knowledge," he said.

"In this type of society, information and knowledge will occupy supreme positions, and computers and telecommunication systems will be indispensable tools for major activities such as service rationalization, forecast making, social planning and decision making," Oguchi

predicted.

Therefore, while other technologies tend to improve the

CW at U.S.-Japan

physical environment for man, Oguchi said computer and telecommunication technologies possess the potential to "directly influence and improve human knowledge and understanding, decision making and cultural patterns."

Specifically, Oguchi said computers should be used to rationalize production by economizing energy and resource consumption and by increasing the reuse or recycling of materials in short supply.

With this effort, computer systems should also be used to eliminate environmental pollution factors which accompany the production process, Oguchi said.

But, since the postindustrial society will be based more on the service to the people of that society than on production figures alone, there will be a wider role for computer systems, he said.

For example, computer systems will have to be used to improve current medical services and to provide a greater degree of security for a nation's people through such things as improved traffic systems aimed at reducing or preventing accidents.

The key to accomplishing all of this will be a "data communication system utilizing computers, telecommunication networks and terminals, he said.

Such a system will permit real-time decision making by gathering, recording and processing a wide range of data concerning such activities as medical service, traffic control and environmental pollution surveillance.

And, while an effective data communications systems will be able to provide such services, he also said it would "consume a

smaller amount of resources and energy and, moreover, cause less environmental pollution," than any other system for delivering the same services.

"In the future, if information technology is to be uniformly infused into a society, it will be essential to link it with social science as well as various other sciences and technologies," he noted.

"With the appearance of a global data communication system, people around the world should be able to communicate and cooperate with each other, thereby maintaining a uniform flow of information and knowledge," he said.

However, he noted that infor-

mation technology is a double-edged sword.

"Unless properly controlled, it can be misused to invade the privacy of others, to build a controlled society or may even cause terrible disorder in case of possible system failure.

"Moreover, the system derived through information technology must harmonize with human behavior and social customs if it is to be accepted in a society.

"It is the technologists' responsibility to try to enhance the benefits and eliminate the risks of information technology and, at the same time, to clarify both these facets of information technology to the outside world," he concluded.

On-Line Library Search Having Unexpected Results

By Edward J. Bride

Of the CW Staff

TOKYO — Aside from the expected benefits of making better use of librarians' time, the use of on-line search methods has had some unanticipated side affects, according to several speakers at the Second USA-Japan Computer Conference here.

Two researchers from the Lockheed Palo Alto Research Laboratory, in examining the goal of "providing the public with on-line access to large bibliographic data bases," found a relatively elite segment of the public was getting that access.

After a year-long experiment with public libraries in northern California, researchers Oscar Firschein and Roger K. Summit have discovered "most of the users are technical professors and students... highly educated," with 60% of the users having had "some graduate work" and 40% having advanced degrees.

The libraries have also begun to see a "new class of patrons, people who previously did not perceive the public library as a source of answers to complex

reference questions," they reported.

Chief among this new class of patron is the government itself.

Two advantages of networks of shared files by several libraries were cited by Frederick Kilgour of the Ohio College Library Center in Columbus, Ohio.

First, Kilgour said such networks "can make available vast information resources to individual library users," plus there are economic advantages.

"At the same time that a network is increasing the availability of resources, it also makes possible reduction in rate of rise of per-unit library costs" bringing them "into line with the rate of rise of per-unit costs in the economy as a whole," Kilgour said.

It has been shown, for example, that the Ohio center has enabled cataloging staffs in Ohio academic libraries to increase productivity by 460%, Kilgour said.

By last February, Kilgour noted, about 475 institutions in 36 states were either participating in the Ohio network or had signed to participate.

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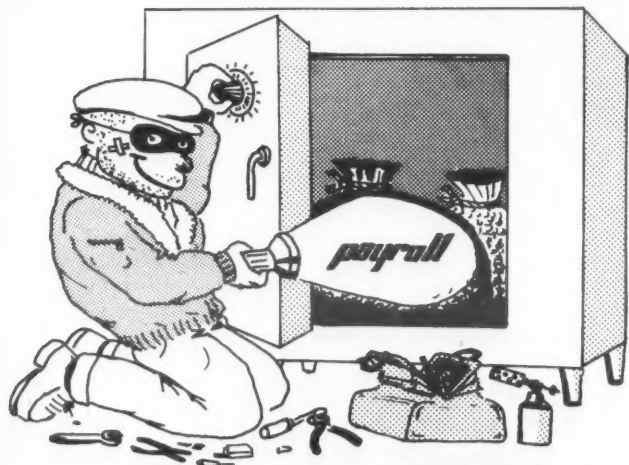
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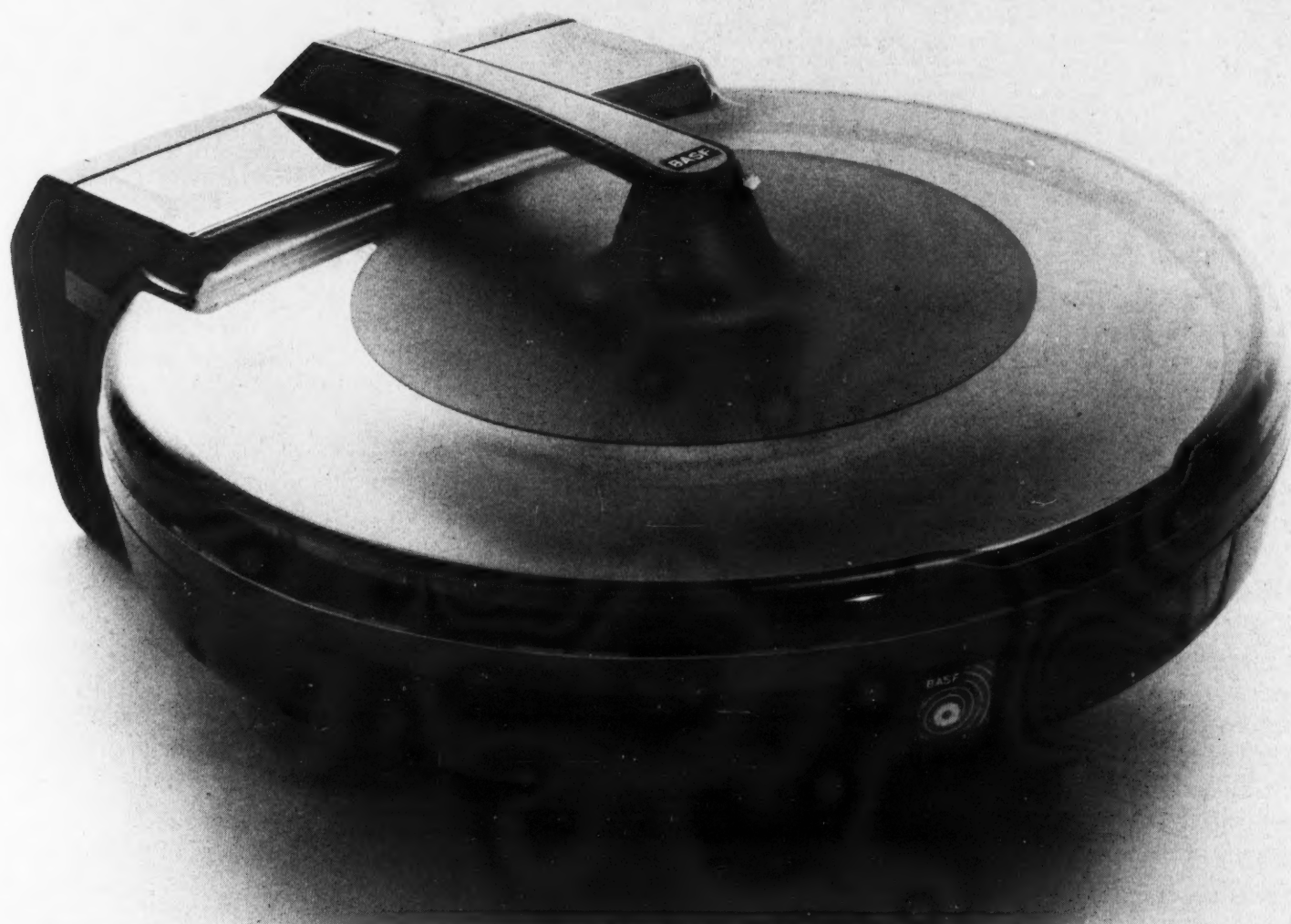
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CRT Provides Agency Data

GREENSBURG, Pa. — If Susan Whitney, age 56, of Murrysburg, needs low-income housing, she can find the right public agency to assist her by consulting a computer terminal.

The terminal will even tell her who to call and how to get there.

This information is the result of a computerized central information service which has been instituted at the Office of the Aging here to help Westmoreland County residents. While aimed primarily at those over 60, it will assist anyone over 18 or minors accompanied by a guardian.

The center, administered by the state Department of Welfare and funded with a grant from the federal Department of Health, Education and Welfare, serves only as a referral point and does not itself provide any services.

The terminal is connected to a central computer located at the MonValley Health and Welfare Council in Monessen, Pa. Some 260 agencies serving Westmoreland County are on file, along with more than 900 agencies serving seven other Pennsylvania counties.

The agency services covered include social services, recreation, employment, health, housing and transportation, among others.

When an individual calls or comes into the office, he simply states his problem, age, sex and residence area. No names are recorded.

This information is keyed into the terminal and the computer responds with the names of one or more agencies in that particular area which can help.

In addition to the agency name, the CRT display includes a telephone number, the name of a contact person at that agency, whether an appointment is needed, whether the agency provides transportation or is accessible by public transportation and any eligibility requirements.

This last notation, according to April Brown of the Greensburg office, allows her to prescreen the candidates.

"Some agencies only take welfare recipients, for example," she said, "and this way we can save the person a useless trip by telling him he is ineligible."

The MonValley center sends each county office a monthly report which lists no names, but does break down the recorded data into numbers served, sex, age and agencies involved.

These reports, Brown stated, will be used to determine where more work is needed and to keep track of the ages and types of problems most frequently encountered.

The case for Tape Management Software.

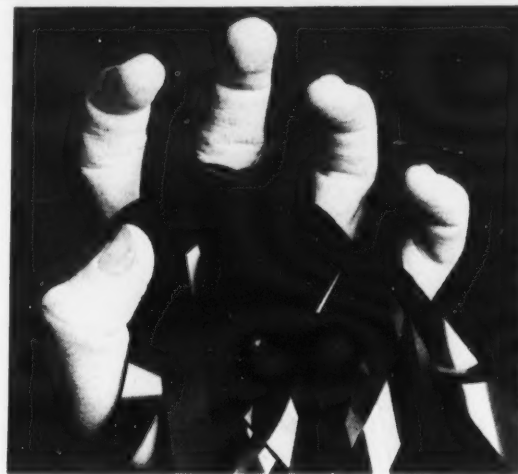
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Study Uncovers Mismanagement of Navy DP Resources

By Toni Wiseman
Of the CW Staff

WASHINGTON, D.C. — The U.S. Navy has installed or is installing late-model computer equipment for systems which are in many cases not fully standardized, inadequate and not designed to exploit the latest computer technology, according to a report to Congress.

As a result of the study, conducted by the comptroller general's office, several recommendations were put forth, including increased documentation of systems studies and the establishment of monitoring procedures to ensure compliance with Navy policies.

A review of the Navy's management of DP resources was made to determine how effectively that body is using those resources, which cost the government some \$300 million a year, the report said.

Program 'Having Difficulty'

Findings disclosed "the Navy's Automatic Data Processing Program is having difficulty achieving its major objectives, particularly in its efforts to develop standard information and data systems — which are the key to the program's objectives — with standard equipment on a command and functional basis."

Bank Project Finds Information Terminal Requires Promotion

ROCHESTER, N.Y. — An experimental customer information terminal here at Lincoln First Bank of Rochester invites checking customers to obtain balance information on their accounts directly from the computer.

Installed to measure customer reactions to automated banking, the unit will probably be dismantled in a few weeks, a Lincoln spokeswoman said. Given sufficient promotion and support from bank personnel, Lincoln believes such terminals will receive a favorable customer response.

The terminal, manufactured by Data-trol, looks somewhat like a 10-key calculator and is similar to that used by Lincoln tellers in verifying balances and other account information for depositors, she noted.

By following the posted instructions and typing in five introductory digits, the seven-digit account number and a four-digit code number which protects the account from access by anyone else, a Lincoln checking customer can obtain complete balance information on the checking, savings or overdraft (cash reserve) portions of his account.

During the first 2-1/2 weeks of use, a receptionist was on duty at the terminal to instruct customers in its use. During that period, the daily usage was about 30 customers, she stated.

Questionnaires netted favorable reaction to the terminal, as did personal interviews, she added.

Security, Privacy Considerations

Questioned about security and privacy, the spokeswoman said that while customers were allowed to believe "code numbers" were issued randomly, in actuality, the number consisted of the second, fourth and sum of the fifth and sixth digits of the seven-digit account number.

"We were fearful some customers might attempt to access information to which they were not entitled; that was the reason for the code number in the first place," she said.

While emphasizing the positive reaction of customers and the success of the project, the spokeswoman added that the addition of a customer terminal in each bank branch "would be an expensive procedure requiring careful planning."

The comptroller general's office concluded the government is, therefore, spending millions of dollars to "sustain efforts beyond their scheduled completion dates and to operate and maintain standard equipment acquired for those systems, without achieving expected benefits, and to retain older computer equipment because of system delays."

The funds were being used to design, develop and maintain interim and non-standard systems operating on that equipment and to supplement saturated computers with commercial computer time, the comptroller said.

For example, the report said the Naval Ordnance Command will spend some \$17 million through fiscal 1975 to sustain the development of its Management Information System for Ordnance Production Activities beyond its scheduled full implementation date of December 1968.

This expenditure, the Comptroller

noted, is the result of difficulties encountered in the multilead activity concept and the redirection of effort after centralizing system development.

Major Stumbling Block

Standardizing, the Navy's major stumbling block, has not been successful "because Navy management allows local commanders to influence unduly the design of standard systems," the report said.

This has resulted in the modification or development of systems which fit local needs, but do not conform to the Navy's overall DP objectives and needs, the report continued.

"The department's management has not been effective, primarily because of the underlying problem of command influence," the comptroller said. "That problem remains under a new management system initiated in 1970 and will not be resolved until the department more strict-

ly controls systems development."

In accordance with this finding, the Comptroller forwarded several recommendations to the secretary of the Navy, suggesting he:

- Require that system studies be documented and that the documentation be part of the equipment justification.

- Review the Navy's information and DP systems to identify, on a system-by-system basis, those actions needed to establish a program for upgrading and standardizing each system.

- Issue to the commands more definitive guidance for making economic analyses.

- Amend his instructions for redesign to require that the alternatives of redesign be considered as part of any economic analysis made to support system projects.

- Require the director of the Navy's DP management to establish monitoring procedures to ensure compliance with redesign policy.

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The simple TICOL language lets you generate your own user programs on the terminal itself, with no separate equipment or central computer support required.

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Versatile "Silent 700" programmable data terminal offers easy operation and powerful options for many business management systems.

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Improving man's effectiveness through electronics

Labor Department Forecasts

DP Employment Prospects to Grow 30% in Next Decade

By Toni Wiseman

Of the CW Staff

WASHINGTON, D.C. — Employment prospects in the data processing field will continue to grow through the 1980s, according to a recent report from the U.S. Department of Labor.

Job openings in the computer field will show an overall growth of 30.4% in the next decade, the report predicted.

The continuing growth in employment demand can be attributed to four major factors, the report said:

- Growth in the number and types of computers and peripheral equipment manufactured.
- An increase in the number and types of organizations using computers or computer services.
- Continued development of new com-

puter uses.

- Increasing emphasis on computers as tools for management information.

A recent Bureau of Labor Statistics (BLS) study estimated approximately 765,000 systems analysts, programmers, computer operators and DP equipment repairmen were employed in 1970 — a rise of several hundred percent since 1960.

While growth will continue, it will be slower than during the past decade. A total of 997,600 jobs will be available in 1980, an increase of only 30%.

The greatest increase will be in the area of repairmen, whose ranks will increase 101.7%. While this represents a large increase in jobs, the actual number of openings will be low, totaling only 72,000 in 1980 compared with 36,000 in 1970.

The BLS report predicted a 60.7% increase in systems analysts' jobs and a 41.6% increase in programmer openings, while 1980 requirements for operators was projected at 275,000, an 83.3% increase.

Employment of keypunch operators is expected to decline to 235,000 in 1980 from 300,000 in 1970.

The 22% drop will reflect a reversal of the employment trend which has prevailed for this employment category during the past two decades, the report said.

Changes in Job Functions

An increasing demand by computer users for sophisticated systems able to do a variety of new things will force changes in the job functions of computer workers, the report said.

"Generally, these changes will take the form of increasingly complex tasks for higher level computer occupations and an erosion of the duties of some lower level workers," the BLS report stated.

The need for improved programming productivity, the growing use of software packages and the necessity for programmers to know more than one computer language will have the effect of upgrading some of the programmers' duties, the report specified. At the same time, some of the more routine work of programmers may be done by computer operating personnel, the report said.

"Finally, the job duties of computer workers also are expected to change because the cost of computer manpower is a major part of the overall cost of computer users, and computer manufacturers have a strong incentive to cut the manpower needed to run their equipment by building into it functions now done by computer personnel," the report stated.

Centralized Facility Under Investigation In Nova Scotia Study

HALIFAX, Nova Scotia — The possibility of a central computer center to serve the DP needs of all provincial municipalities in Nova Scotia is under consideration.

Currently, Halifax has the only computer system in the province for municipal operations. The city leases an NCR Century 101, which it operates in batch mode.

The provincial government, located in Halifax, also operates a computer but does not provide services to outsiders.

Nova Scotia has 65 municipalities, of which about 10 are large enough to warrant use of a computer system.

Feasibility of Alternatives Studied

A study has been under way for the past eight months to examine the feasibility and possible alternatives for such a central facility, according to Charles Smith, DP manager for the city of Halifax.

Under investigation is the possible use of larger equipment, a network of minicomputers or the utilization of someone else's equipment, he said.

"Large equipment would probably be in the area of a Xerox 560 setup," Smith said, "or we could buy time on the provincial government's IBM 370/145 or from a local university."

Either of these potential "service bureaus" probably has sufficient power to handle the extra load, he said, but, in view of the demand for on-line capability, might have to add some power.

The third alternative, Smith said, would be a network of minicomputers. He envisioned the minis located at a central site with one mini, for example, working on taxes, another on social services, etc. Each municipality would then have a concentrator feeding into the network.

While the study is still in the initial stages, Smith said the cost of any central facility would probably be shared among the user municipalities based on usage, plus possibly a standard charge to cover development costs.

"Everyone would benefit from a centralized operation," Smith said, "particularly if operations in the various municipalities were standardized."

This, he said, would benefit the provincial government in particular, since all municipal bookkeeping reports are eventually sent there.

"If the input for their system arrived in a standardized format, they would be ahead of the game," Smith said.

Systems network adaptability

If your business system involves tying your Model 742 terminals together in a complete communications network, TI offers the Model 700 TPS* Terminal Polling System.

Designed around the TI Model 960 Series minicomputer, the TPS automatically calls remote "Silent 700" data terminals, collects data stored on the magnetic tape cassettes, and logs the data on magnetic tape in a format readable by a host computer.

This scheme gives users a complete, cost-effective data capture network for distributive data processing and communications.

International Harvester found more...

International Harvester, which recently selected a large quantity of these models for use by its dealers for remote data entry and local processing in Service Parts Inventory Management and Dealer



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Editorial

Your Serve, Telenet

The advent of a packet-switched communications service by Telenet Communications Corp. [CW, Aug. 27] marks the first commercial offering of a value-added network. But it also makes users wonder about the benefits.

The basic concepts were spawned by the Department of Defense Arpa network, and this type of network is now also operating in several European and Asian countries. But most of the existing nets are operated by government and/or research agencies serving mostly the same type of noncommercial users.

The Telenet service seeks to transfer the promised benefits of packet-switched networks to business users. One of the primary selling points is the idea that the user pays only for the amount of data actually transmitted (in addition to certain fixed monthly charges).

Another less tangible benefit is the promised more efficient utilization of communications links. The packet-switching people believe their transmission methods, which restructure the data into packets, are more efficient than conventional transmission modes.

What all this means to the average data communications user is still highly problematical. It is somewhat disconcerting that the first Telenet user turned out to be a time-sharing vendor with a high-volume data network.

While this type of "user" certainly is among the most innovative, the needs of a time-sharing vendor bear little resemblance to a company that operates a nationwide network for its in-house data communications needs.

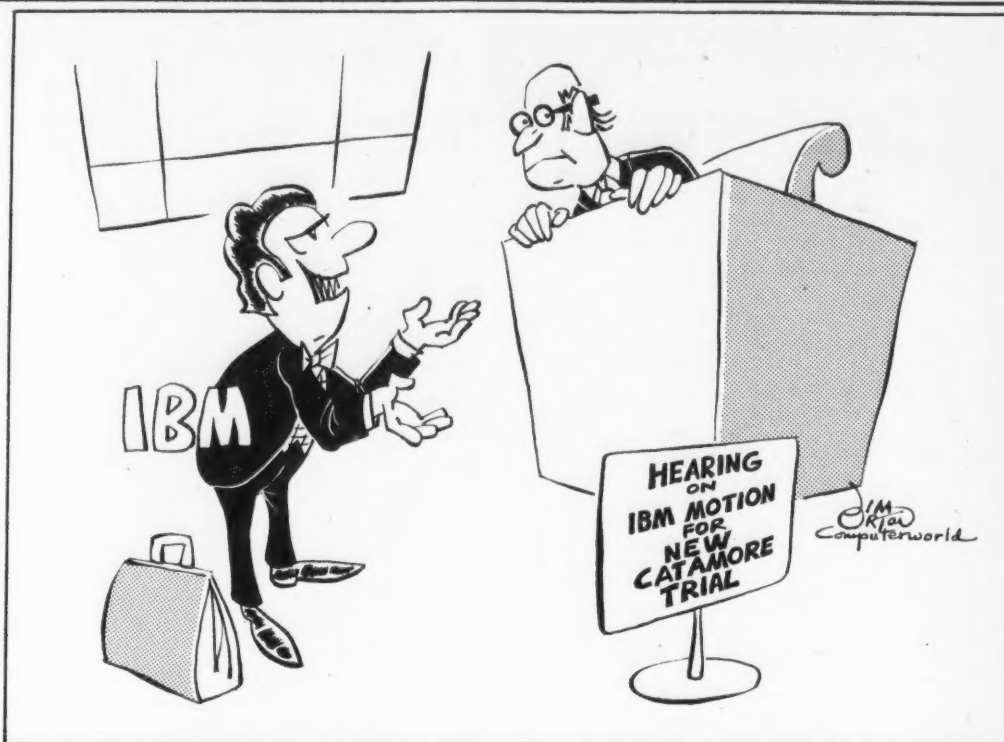
Another yet-unanswered question relates to the benefits of packet-switched services for the smaller, low-volume data user. This is the user who may want control over his own DP equipment and lines, but does not have the volume to justify the operation of a private network.

Telenet now provides the opportunity for users to weigh these and other trade-offs. Unlike other new carriers, Telenet seems to have the blessing of AT&T, on which it must rely for most of its lines.

Whether this Bell cooperation will change if Telenet proves to be a popular answer to current data communications problems remains to be seen.

But, for now, the ball is in Telenet's court. If the company can sell users on its packet-switched service benefits, the demand for facilities might well exceed Telenet's growth projections.

Data communications users are a cautious and skeptical lot. They will be watching this venture with interest.



"Your Honor, Our Software Agreement With Catamore Was Too Vague to Be Enforceable — How Can You Give Anybody the Moon?"

Letters to the Editor

Wrong Comparison Chosen To Illustrate Discrimination

Joseph T. Rigo (Aug. 27) has chosen the wrong comparison to illustrate discrimination or non-discrimination in DP based on sex.

Rather than comparing women who stay on the job with men who stay on the job, he should compare women who "drop out of the labor force for 15 or 20 years to raise children" with men who "drop out of the labor force for 15 or 20 years to raise children."

Sauce for the gander is seldom sauce for the goose and, anyhow, how can he be so dense as to believe that raising children is not labor?

Sally F. Dennis

Montrose, N.Y.

Names Cause Problems, Too

In regard to Alan Taylor's column, "Why Does BankAmericard Still Regard Us as Numbers" [CW, Aug. 20], I completely agree the system does not seem to have enough checks, but I disagree with his solution of using names.

An account card is a necessity to keep account transactions separated. The account number, with proper checks against it, will help keep the accounts straight.

If account names were used on the card, even with a check digit or character, you would easily run into problems because many people have the same name.

If account names are used without a card, you have problems like I have had when I received bills for Ronnie Gardner, Ramond Gardner, Ronald Gardner and Rodney Garner. You may also have problems if your initials and last name are the same as someone else's.

Another case is when a name can be spelled different ways by different people, such as my wife's. The name "Sheryl" can also be spelled "Cheryl," which might cause someone else to be billed. My wife's name can be signed Mrs. Rodney Gardner, Mrs. R.T. Gardner, Mrs. Rodney T. Gardner, Mrs. Sheryl Kay Gardner, Mrs. Sheryl Stevenson Gardner or Sheryl K. Gardner.

Rodney T. Gardner

Winnsboro, S.C.

Desk Reference Aid to DPs

I follow with interest most of the trade publications involving the computer and communications industry. None of the publications have informed their readers of the availability of a very important desk reference work on the computer industry.

The document I am referring to is the record of hearings held before the Subcommittee on Anti-

trust and Monopoly of the Committee of the Judiciary U.S. Senate, 93rd Congress, on S-1167, the Industrial Reorganization Act.

Part VII, entitled "The Computer Industry" covers hearings dated July 23-26, 1974.

The report contains full transcripts of the testimony submitted to the committee as well as exhibits which would be of interest to everyone concerned with the computer and DP industry. For example: International Data Corp. submitted extensive data as to the size and characteristics of the marketplace, various divestiture plans prepared by Control Data Corp. in the course of its litigation against IBM, the full text of the original complaint in the U.S. vs. IBM antitrust trial, the full text of Judge Christensen's decision in Telex vs. IBM, the full text of the judge's decisions in Honeywell vs. Sperry Rand, as well as the testimony of a variety of other industry observers and experts.

Copies of the record of these important hearings are available for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The price is \$9.55 per copy.

A.G.W. Biddle
President

Computer Industry Association
Rosslyn, Va.

Itemized Lists Third Alternative

In considering the question of price marking in supermarkets, have any of the systems in use or under development considered a third alternative — itemized lists? It seems as though it would add minimal cost to the system to provide customers with an itemized list of purchases by brand name, item, size and cost.

On the other hand, it would provide the customer with an advantage in comparing costs, since corresponding purchases could be compared on the basis of factual data.

R.J. Gartner

San Jose, Calif.

No Price Marking Back Then

When I was young, my mother would take me to the grocery store. She would tell the clerk, item by item, what she wanted and the clerk would get each item from behind the counter.

When he had gathered all of the items, he would write the price of each on a sack, add them manually and tell my mother the total.

None of the items was price marked, and no one objected. What's all the fuss about?

Sydney B. Self Jr.

Waltham, Mass.

(Other letters on Page 22.)

Back to Civilization

The scientific and engineering user community, especially that part which still requires or at least enthuses over the giant number crunchers, is beginning to talk again about Old Seymour, the last of the Neanderthals. Soon to be extinct, like the sabertooth and the cave bear, Brother Cray has awakened from enforced hibernation and is stirring rural Wisconsin to frenzied activity. Indeed, conversation about the Cray One is supplementing gossip about new dairy cow productivity records in Chippewa Falls, the metropolis of the region. I've been reliably informed that the proposed relocation of the giant-computer activity from that smog-bound urban center to nearby Elk Mound (population 471) was canceled by The Hero Of Livermore when he found out the city fathers were planning to pave the cross street.

Joking aside — and I really do think his projects have been hurt by his desire to remain a rural recluse — Cray has been responsible for the design and the partial construction of the majority of giant machines in place around the world. In white hat applications like numerical meteorology, in darkest nuclear weapons country, his Control Data offspring are dominant. I'm genuinely delighted to see his group surface again, even if still in eremitic Chippewa Falls.

It is the more disappointing, therefore, to see

Cray, like Amdahl-san, eschewing architectural novelty and wild new Elsi [extremely large-scale integration] components. The great thing about Stretch, the IBM venture into supercomputers of 15 years ago, was that the designers tried far-out transistors, the look-ahead concept, freon cooling and early overseas installation, all in one giant gamble.

"Ah," you may say, "but Cray and Amdahl are poor old codgers, not rich like IBM!" In a sense that is true, of course: even with money from Livermore and from Fujitsu respectively, neither man has had a bottomless purse to dip into. Neither did Dunwell and the other Stretch boys, though, even within IBM, and it seems to me that what Cray should be offering Livermore and other prospective customers, and Amdahl should be offering the Japanese, is far-out architecture, not economy.

The American taxpayer, I believe, would in the very long run get a reasonable return on his involuntary investment via the old Atomic Energy Commission and Sid Fernbach's Livermore shop, if it produced crazy new stuff like a hopped-up associative processor or the first hologram memory, rather than dull software-conserving extensions of current very big machines.

The giant-computer museum at Livermore

really ought to be shut down, or cut back to a couple of megaminis. Its ultimate product, deadlier nuclear weapons, and its methodology, the Octopus time-wasting system, are as obsolete as the high-speed line printer and the hand trucks of paper output per hour that they encouraged. Only if real innovation, another genuine *stretch* of number-cruncher architecture or componentry, could be attempted, should the enormous wastefulness of that shop be continued.

Seymour, we need you! But we need you to try weirder systems than the Cray One. Move to Cambridge or California, Old Cave Bear — build us a wild one!



Herb Gross

For Last Word on Contracts

Technician Must Play Two Roles in Vendor Dealings

Part 1 of this series on users' legal rights [CW, July 30] discussed the circumstances under which computer contracts could be set aside, thus lifting the restrictions to the rights of a computer user which are included in most preprinted, vendor-created contracts.

These circumstances included when the contract was obtained by giving the user incorrect information; when essential information was omitted; there was a lack of intention to be bound by the contract terms; and/or there was a failure to warn the unknowing customer of the dangers potentially involved in the use of the vendor's system.

Part 2 [CW, Aug. 13] translated these legal concepts into the computer procurement environment, dealing with the position during the proposal, implementation and use stages.

Part 3 [CW, Aug. 27] dealt with the types of remedies that are available, including benefit of the bargain, being made whole and punitive damages.

Computers are not desirable in themselves. No one hangs them on art gallery walls or buys them for themselves. Few manufacturers sell computers for themselves. Generally, computers are bought because they are expected to provide results in a foreseen way at a foreseen cost.

Getting results from a computer involves many things. It involves the nature of the apparent results themselves, of course. Are they really accurate? Are they really reliable? Do they turn out on time? Is the information provided as useful as it was originally said it would be?

It also involves the cost of the results. If

a computer vendor gets a computer order on the basis that the results will be obtained with a staff of one operator, and it takes the user three systems analysts and four operators to obtain these results, then the original representations have not been kept, for the representations considered the costs as well as the performance.

Yet again, vendor representations often involve the timing of the results. If they were supposed to become available in January, but did not become available until June, that again would not be keeping the bargain.

Real-World Compromises

Normally, however, a user is more interested in getting some of the results or in getting them shortly after they were originally due, than in giving up the project. From a legal point of view, indeed, it could well be that going on with the project despite some apparent failures to meet promises is obligatory so as to minimize any damages the early failures had already resulted in.

So, there is no reason the user technical staff should not plan various compromises to meet the contingencies that can occur, even though these may involve accepting some changes in the original proposal.

User Responsibility

What could be wrong, however, is to accept total user responsibilities for these changes, when in fact they result from vendor problems. A user technician in being authorized to get a system implemented, is normally not authorized to change the terms of a contract. And there is no reason for him to be so authorized. A certain amount of humility is called for when dealing with vendor personnel — one should not upgrade one's technical authority beyond that which is needed for the job in hand — the implementation

of the system.

Similarly, when the system is tested and accepted for use, an in-house technician should ensure the vendor takes his full share of the responsibility.

The tests the vendor provides are all well and good — but do they really show the system is going to remain reliable year in and year out? I doubt it.

So the user technician should let the vendor personnel say the system is ready for live use, rather than assume he himself can really determine this.

Naturally, once the vendor has said it is ready, the user can assume it is and work on that assumption — but it is still better to let the vendor sign off first.

Don't Dump Proposal

Outside of these purely defensive measures, a user should not let the vendor forget that his contractual terms, no matter how stringent, can be challenged, unless he took a great deal of care during the proposal period to give information and to provide warnings of dangers.

Any argument that the vendor proposal, for instance, is to be disregarded because of some term disowning it in the written contract can be countered from legal as well as from ethical standards. IF the proposal statement now appears to be inaccurate, this directly raises the question as to whether, when the proposal was made, the true facts were known and concealed. If they were, false statements were apparently included in the proposal. So the whole written contract may well be invalid, including the clause disowning the proposal.

Ignorance No Excuse

Even if the proposal statement was not originally known to be incorrect, the vendor is not necessarily home scot-free. If the computer user relied upon something which by its nature he can see was only a salesman's estimate such as a forecast of

the amount of business the user would do when the system was installed, the vendor will not be saddled with responsibility for that. However, if the proposal statement dealt with something that was knowable, such as timings for a particular run, then the fact the vendor actually didn't know the timings does not shield him from the consequences of providing incorrect estimates under the guise of providing actual timings.

In brief, the user technician has to wear two hats and to keep them distinct in his mind. As the person responsible to his own management of implementing the system, he must deal with reality, accept and minimize delays, costs, overruns, etc. In this capacity, he should deal with the vendor simply as an implementor of a contract entered into by his employer, not by himself.

Then, when acting as a contract negotiator or advisor to his firm's negotiators, he should expect to rely upon the proposal and other material, at least until the vendor tries to claim it wasn't included in the contract.

Then he should ask the vendor to explain why his firm should be restricted by the terms of the contract when the order was apparently obtained through the use of the inaccurate proposal.

Showing an understanding of the duties of the vendor to act responsibly and not to shield himself under legal doctrines of unenforceable agreements will perhaps surprise the vendor salesman.

It will, however, prevent a situation from deteriorating and can stop that feeling of hopelessness that comes to someone who reads those contract forms and thinks they are the last word.

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The Taylor Report

By
Alan Taylor, CDP



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Software Protection Seekers Need Sound Perspective

By Roy N. Freed

Special to Computerworld

Many computer people and lawyers make the common mistake of trying to examine the question of software protection in isolation, separate and apart from other legal considerations. In doing so, they run the serious risk of proposing solutions that themselves introduce adverse legal consequences. Let me develop this point concretely.

Many people insist that statutory copyright is the proper — if not the ideal — measure for protecting software programs from unauthorized use. However, that protection reposes in the "writings" that reflect the program steps, such as the coding listings, and possibly also the magnetic tapes and other computer media for generating signals reflecting the coding to the computer, if and when courts hold those media to be "writings."

It does not repose in the process or series of steps themselves. This is a very important distinction because software program suppliers are not content to make their money charging for copies of the copyrighted work, as traditional publishers are.

Instead, they try to market their wares by pricing separately each program per CPU and by trying to restrict disclosure of the nature of licensed programs to others.

Incidentally, the first of these marketing tactics requires, for its legal foundation, that the supplier be able to control the use of the media, which copyright ownership alone does not support. The latter effort might be fundamentally inconsistent with statutory copyright.

Supplier Invites Adversity

With the statutory copyright approach, the supplier invites a number of adverse legal consequences for itself and its customers. The legal arrangement focuses on the media or the documentation or both.

It is thus very similar to book publishing and identical to the distribution of motion picture printers, which involves the leasing of copyrighted items. As a result, the transactions between supplier and user might become subject to sales and use taxes applicable to the charges.

Similarly, the computer media and documentation might be treated as tangible personal property subject to annual taxes, where they are in effect, on that type of property. In some states those taxes are imposed at high rates.

If the supplier purports to sell the software programs, which is rare, then the tangible personal property taxes fall on the customer.

More normally, where suppliers purport to have ownership of the computer media and related items, they are exposed to the tangible personal property taxes. That financial burden can be considerable.

Many suppliers which rely on retained ownership of the computer media as an adjunct to statutory copyright also might expose themselves to the need to qualify to do business in the states in which their licensees operate.

This corporate qualification involves expense and administrative burdens that would be preferable to avoid. The licensor of software that asserts ownership of the computer media might be in the same situation, for these tax purposes, as a lessor of computer equipment.

This brief review indicates why it is advisable to devise a software program marketing strategy from a sound legal perspective. Alternative means for legal protection for software programs well might be available that have

protective qualities at least equal to those of statutory copyright but escape some, if not all, of

that process.

Rather than being the very heart of the transaction, the

ess.

If that approach can be established effectively, the taxes and corporate qualification burden discussed above could be avoided.

It is important to recognize that some apparently simple transactions in the computer industry can run the risk of major economic and legal impacts. All transactions deserve to be examined carefully early in the game. Many adverse consequences can be avoided by foresight.

From a Legal Viewpoint

the taxes described above.

The trade secret route to protection is a good example. It is based on the position that the "software program" is a process for processing information. The customer is licensed to practice

computer media and documentation can be deemed to be merely means for communicating the nature of the processes involved, equivalent to the technical manual normally furnished the licensee of a manufacturing proc-



Lessons From Iconoclast and Smoothdog

Choice of Efficiency or Maintainability Subjective One

By Miles Benson

Special to Computerworld

Which is more important, efficiency or maintainability?

That's a pretty interesting computing question.

It turns out to be one of those dividing-line things, like

The Sociology of Computing

the Vietnamese war, where people tend to choose up sides, and get locked in, and quit thinking about the underlying issues any more. Advocacy, not reason, results.

You may not recognize it as a fundamental question, the way I've asked it. Let me ask it some other ways, then:

Which is better, Assembler language code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

Beginning to get an image?

There's Byron Iconoclast, speed-demon coder, who can spout machine language instructions at the drop of a core dump, solve all the tough problems in your shop including some you didn't want solved, work hours so odd no one is

sure he's ever there — except for the spoor and working programs he leaves behind — and give everyone else the feeling they're inferior to him in some way they don't understand.

And then there's Samuel Smoothdog, documentor extraordinaire, who writes programs which are so readable that he had one published in the *Saturday Evening Post*, has memorized the programming standards

manual and quotes it at the drop of a design review, wears suits imported from IBM-Poughkeepsie and gives everyone else the feeling that he's going to be their boss some day regardless of who's superior.

Back Up a Little

Now that we're on the same wave length, let's back up a little ways. This is a "Projects Which Failed" story, right?

Well, considering that probably most computing shops have a zoo full of Byron Iconoclasts and Samuel Smoothdogs (and, what's even more interesting, probably need them both!), where's the "Project Which Failed"?

Well, try to picture the worst possible environment for Byron Iconoclast and Samuel Smoothdog. Got the picture yet? Assign them to the same (gasp — now you've got it!) project! From here on out, the story pretty well writes itself.

Clever Devil Toy Co. does more computing work than one might think. Besides the billing and payroll and all that jazz, it has some market analysis programs and some design code and even a simulation or two. And enough smarts that it occasionally bids on, and wins, a software contract. It helps balance out the industry's cyclic loading of people and computers, top-level management says.

All of that makes both Byron Iconoclast and Samuel Smoothdog, Clever Devil employees, very happy. It gives them some interesting projects to get involved in.

One of those projects, though, was an unmitigated disaster. It was a hardware analysis program, subcontracted to Clever Devil by a leading auto manufacturer, General MPG, which had more computers than it had people to configure them.

The purpose of the project was to analyze the General MPG shop, both hardware and software, for effectiveness by inserting software probes at various sensitive points and measuring microengstroms and nanocuries and drawing some automated graphic pictures of who was doing what to whom within the system.

Tricky stuff, but important, and worthwhile, and a veritable salivation stimulator for the Byron Iconoclasts of the world.

Off Went Byron

Well, off to work went Byron. I mean that literally. It's not just that Byron flew off to Battle Creek to study General MPG's installation first hand. It's more that he did his analysis during production time at the General MPG computer consoles, his sleeping in the General MPG staff meetings, his coding in a previously graffiti-free area of the General MPG Executive Person's Room — and he even tried to enter the General MPG supersanct Advanced Styling offices in order to use its graphics consoles for some system modification work.

At any rate, what happened next was quite predictable. To

(Continued on Page 22)

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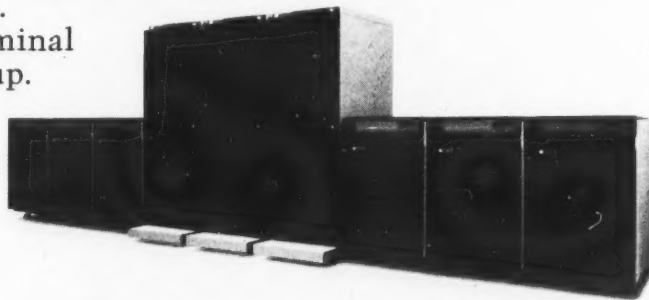
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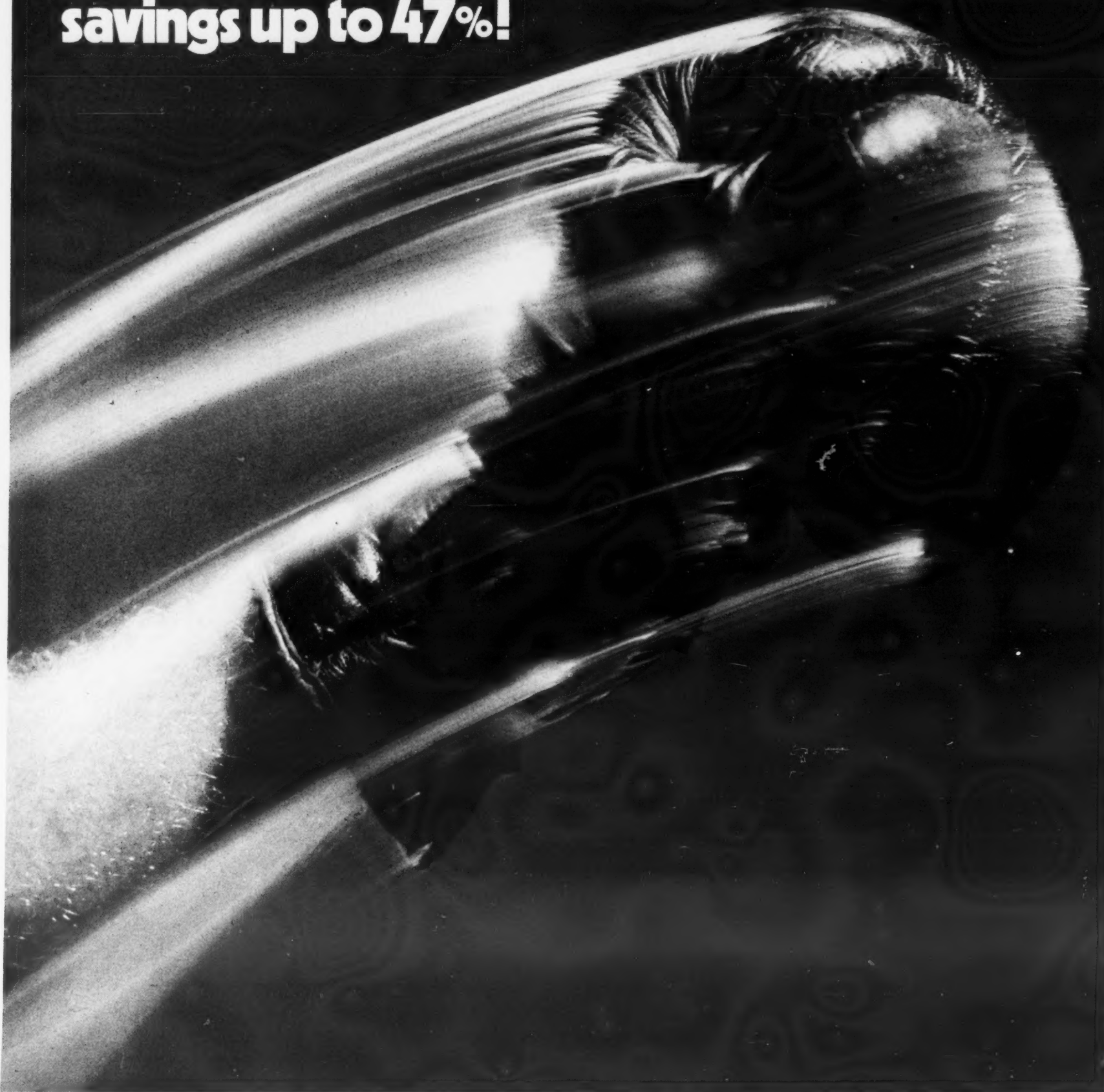
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Emery	10.94	10.94	17.35	21.74	26.10	37.20	47.24	57.16	105.86	158.79
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Efficiency or Maintainability? Choice a Subjective One

(Continued from Page 19)

put it automotively, Byron was recalled. General MPG had had it up to its hood ornaments with Byron's tie-dyed tee shirts, open-toed tennys and Adam's apple-length hair (front and back).

Clever Devil was told to either unplug Iconoclast or unplug the contract. It made the obvious choice.

The Plot Sickens

However, and here is where the plot sickens, Clever Devil was in real manpower trouble. It was in the midst of simulation and market research studies for a possible pre-Christmas announcement of a toy Soyuz-Apollo spaceship kit, and every person on its programming staff was already lashed fast to the coding pads. Byron's return was welcome enough; but how do we replace him back at Battle Creek?

You, of course, are way ahead of me in the plot line. You know that Clever Devil is going to pick, by some undefinable process, Samuel Smoothdog to replace Byron, right?

And off went Samuel into the halls of General MPG.

There were some good things and some bad things about sending Samuel to Battle Creek. The good things were that they loved him there. Samuel was to General MPG as the installation of a Pepsi-Cola sign would be to a spot 800 miles northeast of Timbuktu.

Samuel did his analysis at the desk provided for him by General MPG, his thinking in the General MPG staff meeting, his coding on official General MPG coding pads, and he did right by both the General MPG Executive Person's Room and the General MPG Advance Styling offices. In short, he was, in a personal sense, a Computing Godsend.

But there were also the bad things. I don't know how to tell you this, but you can't ask a high-level language man to tinker with an operating system. You can't ask a general-purpose man to service nanosecond-dependent interrupts. You can't ask a readability man to write intricate solutions to intricate problems.

To be brief, Samuel stubbed his Florsheim brogans on the task's technology. It was too much for him, and the standards manual didn't show him a way out.

To make matters worse, by the time Clever Devil, General MPG and Samuel Smoothdog (in that order) realized that fact, it was nearly too late. Sam had destroyed all of Byron's original efforts as unmaintainable, ungeneral-purpose and unreadable. When the second recall occurred, Clever Devil was really right back at ground zero.

And it had proven the old adage — you

can't make a sow's ear out of a silk purse. But it hadn't fulfilled the General MPG contract.

It was lucky for Clever Devil that hardware analysis was what it had contracted to do. I mean, if you fail totally, and do nothing, then you haven't hurt the company you failed to satisfy except in the pocketbook. Its hardware runs just as it did before, and its software is uncontaminated by any changes (fortunately, Samuel Smoothdog's revisions were well-documented and easy to remove).

That hunk of philosophy didn't really help General MPG, or Clever Devil, but it was all they had.

The contract was defaulted, and the project failed.

Now, I'm going to give you a little quiz: Which is more important, efficiency or maintainability?

Which is better, Assembler code or high-level language code?

Which is better, special-purpose code or general-purpose code?

Which is better, clever code or readable code?

You have 60 seconds to answer. Oh, and before you start, these are not yes or no questions. I want an essay response.

Start!

Letters to the Editor

Certification of DPers

Putting Cart Before Horse

The nonproductive arguments over certifying or licensing so-called "data processing professionals" have wasted enough of *Computerworld's* valuable space.

I circulate quite widely among the working computer community and I've never had a discussion on this topic with an individual who believed such certification makes any sense at this point. And this includes many holders of the Certificate in Data Processing who uniformly have gotten certified just in case it might mean something to someone else.

It is putting the cart several miles in front of the horse to play at certifying before knowing such a thing as a "data processing professional" exists.

It would surely be possible to certify that individuals are "Fortran Programmers," "Cobol Programmers," "hardware monitor specialists" and so forth, but to insist we must be "professionals" insults those among us who think we are tradesmen, artisans or hourly laborers.

If skill tests existed covering a dozen or more of the crafts needed to use real computers in productive environments, then (perhaps) a practitioner who had passed all of the individual tests might qualify to be called something like a "master" of the computing trades. And after several hundred had qualified as "masters," they could decide who would have to bear the label of "professional."

Please, almighty appointive bodies, get to something worthwhile — or at least to something that won't distract the people at work. The issue of the number of angels that can stand on the head of a pin is still open for resolution.

Michael F. Morris

Falls Church, Va.

Mildred the Mugger Lauded

Joseph T. Rigo's account of "Mildred the Mugger" and her professionalism [CW, Aug. 20] was brilliant! Not only that, it was beautifully written.

Why doesn't *Computerworld* get Rigo to quit hiding his light under a bush and become a regular columnist for CW?

Laurence F. Wygant

Chicago, Ill.

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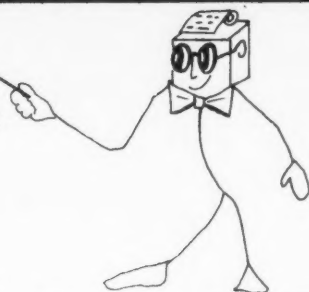
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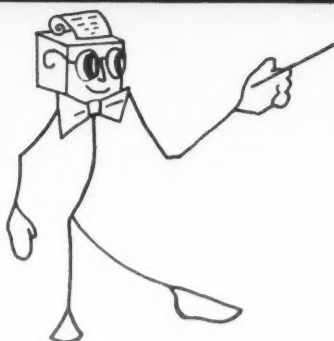
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T/S Service Keeps Containerized Shipments Moving

NEW YORK — Shipping Intelligence, Inc. has a complex function: keeping track of 100,000 shipping containers a year. It pinpoints the location, contents and destination of any container or traces a container's movements during past voyages.

Before containerization, shipping companies tracked ship voyages; now they track fleets of containers. New logistical problems presented by container shipping have resulted in sophisticated control systems that can be best managed by computers.

Shipping Intelligence, founded 10 years ago, provides a variety of management programs tailored to the needs of the shipping industry. Its president, Sydney P. Levine, is a computer consultant specializing in the marine industry.

The economics of containerization makes it important to know the status of every container used by a shipping company. Because all shipping companies lease all or part of their containers, the most effective container control system is one which is able to identify how many containers are not being utilized.

"If we can help a shipping company reduce its container fleet by 100 unnecessary containers, we can save it at least \$73,000 a year in rental and storage costs," Levine said.

Used in T/S System

The container control program was designed for use in a time-sharing system linked to a data base maintained on the National CSS, Inc. network. The nature of pier operations makes time-sharing the most cost-effective system for the job, Levine said.

One customer is Northeast Marine Terminal Company, Inc., a multiuse terminal in Brooklyn, N. Y. serving both conventional and container ships.

Despite its special requirements, containerization has proved a boon to the cargo freight industry and its customers.

Containerization has speeded up the process at every stage and reduced costs. The combination of container shipping

and computer controls now allows a ship to reach port, unload and leave with a new load the same day. Cargo delivery is expedited in hours rather than days. Labor costs are minimized all along the way. Steamship lines get more productivity out of each ship and manufacturers can ship goods at a lower cost and with greater speed and security than before.

The terminal has the responsibility of accounting for all containers and for providing the necessary documents to move cargo on and off the ship to consignees.

One test of the computer system comes on the day a ship arrives. Ship cargo information has preceded it from each

port, and a computer printout is available at the pier before the ship docks. The shipping documents are arranged in a format that can be easily used by terminal personnel.

Levine believes an important asset of this program is its usefulness to non-technical workers. "After all, dockworkers are the people who must supply the computer with accurate information and then use the reports the computer can produce," he said. "So we keep our program as close to the traditional methods of recording shipping material as possible."

With on-line access to this data, North-

east Marine can give its customers a delivery status report and know when an empty container returns to the pier after delivery and when the same empty container is being loaded for shipment overseas.

Container control must go further than normal inventory systems, Levine said, explaining, "In general when an item leaves inventory, it never returns. With container inventory, each particular container becomes available many times in its economic life."

The inquiry procedure also enables the terminal to trace missing containers over several months and voyages.

CPEUG Meeting for Novices, Experts

By Don Leavitt
Of the CW Staff

OKLAHOMA CITY, Okla. — The welcome mat is out again at one of the national gatherings of people interested in measurement and evaluation of their DP operations.

The Computer Performance Evaluation Users Group (CPEUG) has scheduled its 1975 meeting for Sept. 23-26 at the Holiday Inn here, according to CPEUG chairman William LeTendre, who works at the U.S. Air Force's Electronic Systems Division.

Once a small Air Force gathering of technicians interested in simulation of computer systems, CPEUG has long been open to all government personnel interested in optimizing DP operations using any of the available tools and techniques. In the past year or two, the group has welcomed participants from the private sector as well.

This year's session will include both formal presentations of results achieved — with a variety of hardware configurations — by the people who have conducted computer performance evaluation (CPE) projects, theoretical approaches to unsolved problems and workshops for those who have only recently

become aware of CPE.

Informal discussion groups, formed at the conference to cover problem areas of interest to a number of attendees, will be on the schedule Wednesday and Thursday afternoon, Sept. 24 and 25, running concurrently with vendor presentations of hardware monitors and simulation packages.

Doubled Up

Concurrent technical sessions are also scheduled for Tuesday afternoon and Thursday morning, according to program chairman Dennis Gilbert, a technician with Fedsim. This year's schedule had to be doubled up, he said, "because there are just too many good papers to cover consecutively in the three and a half days of the conference."

Copies of papers presented at this year's meeting and a number of those given at the two previous CPEUG sessions will be included in the proceedings available at the registration desk, Gilbert said. Total cost of registration and proceedings is \$20, he added.

In order to get the conference started promptly on Tuesday, Gilbert has scheduled an early registration and "get-acquainted" session on Monday evening.

All sessions will be completed by noon on Friday, the 26th, to allow plenty of time to get home for the weekend, he noted.

LeTendre is at Hanscom Air Force Base, Bedford, Mass. 01731; Gilbert is at HQ, USAF, Fedsim, Washington, D.C., 20330. Each said they would welcome inquiries, but added the best way to see what CPEUG is all about is to join them here later this month.

Library Adapted To Xerox Sites

HOUSTON — Even though users of Xerox computer systems are disappointed by the company's announced plans for software support in the future [CW, Sept. 3], they may find solutions from independent software houses.

International Mathematical & Statistical Libraries, Inc. (IMSL), for example, has just announced versions of its Fortran subroutine libraries for both the Sigma series (modes 6, 7, 9 and 11) and the newer 560 CPU from Xerox. (A library for the Digital Equipment Corp. Decsystem-10 was introduced at the same time, the vendor noted.)

In its press release, IMSL met the situation head-on, albeit redundantly: "In spite of the recent Xerox announcement, IMSL has decided to continue to support the Xerox computer users due to the high degree of interest in a Xerox library before and subsequent to the Xerox announcement."

With the additions, the IMSL libraries are now available for Fortran users working with equipment from six mainframe vendors.

The library is available for \$960/year for universities and \$1,200/year for other installations from IMSL at the GND Building, 750 Bellaire Blvd., 77036.

'Ramis' Update Cuts Resources Used, Speeds I/O

PRINCETON, N.J. — Release 5.4.5 of Ramis, the data base management/report system from Mathematica, Inc., contains nine major improvements and "numerous" minor additions and changes from IBM OS, VS, VM and TSO installations and users on the National CSS network, according to the vendor.

A basic change in the report processor reduces the time needed to prepare reports. In addition, the user now has control over the amount of working storage allocated to report preparation, allowing trade-offs between production and CPU time and use of the storage resource.

A change in the way Ramis handles networking of files has resulted in decreases of processing times of 2-to-1, Mathematica claimed. Again, the working storage for processing of pointers is now controlled dynamically by the user.

"Another increment of efficiency" results, he said, from Mathematica's reprogramming of Ramis' procedural computation facility. The rework in this area reduces the time required to perform calculations, enhancements therefore cover output, input and internal processing.

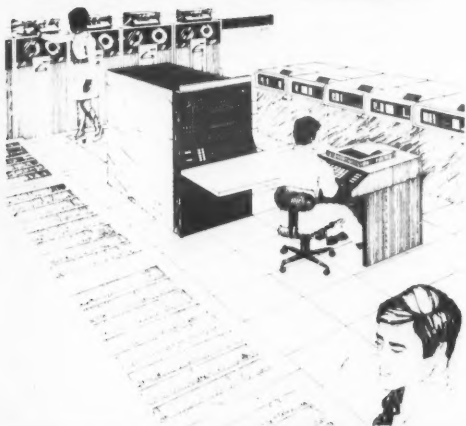
Various improved functional capabilities

have been added. With the financial planning subsystem, for example, a user can operate from a read-only disk, which protects the data even when several people are accessing it simultaneously.

Service procedures perform functions such as listing names of cataloged procedures, listing them after deletion of an unwanted procedure, listing a file dictionary or rebuilding the file of cataloged procedures to conserve space.

The basic Ramis system can be leased for \$840/mo or acquired under license for \$28,000 plus maintenance from Princeton Station Office Park, 08540.

Musing of a DP Manager



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Purchase Orders Managed

NEW YORK — IBM 360 and 370 users operating under OS/VS or Univac Series 70 users under TDOS can perform many of the repetitive non-analytical tasks associated with purchase order placement with the Automated Purchasing System (APS II) from Decision Concepts, Inc.

The system can generate purchase orders as requested whenever the vendor and price of the desired items can be determined from a "presourced" parts file. Alternatively, purchase orders can be generated based on analysis of purchasing activity.

A third option permits generation of purchase orders — without user supervision of each order — on low dollar-value items, the vendor said. When buyer action is required, APS II prepares documentation containing recent procurement activity to aid in the purchasing decision.

The system supports retrieval of purchasing history, quotes and outstanding orders and requisitions. It contains an integrated receiving module to update the open order file and includes interfaces with both accounts payable and inventory systems.

Reports from the system include a purchase order/purchase requisition register, input and output audit reports, expediting logs, buyer/vendor analysis and blanket order registers.

Vendor and commodity ranking by dollars placed, a vendor directory and mailing labels are also produced, a spokesman noted.

Written in ANS Cobol, APS II has been implemented in 128K bytes in an IBM OS/VS environment on a 370.

The system ranges in price from \$50,000 to \$75,000 depending on options selected. Decision Concepts is at 280 Park Ave., 10017.

Major System 2000 Enhancement To Include Recovery Facilities

AUSTIN, Texas — Phase I extensions to System 2000's current save/restore and rollforward facilities will be available in Release 2.80, scheduled for delivery during the second quarter of 1976, according to the vendor, MRI Systems Corp.

Features being added to the data base management system are upwardly compatible in the release and will be available to new as well as existing customers.

- The extensions include:
- Program-initiated rollback/restart.
 - Autorollback/restart.
 - Checkpoint/restart.

Program-initiated rollback/restart will allow executing System 2000 natural language, PL/I message or PL/I batch programs to terminate, roll back and restart update transactions.

Autorollback/restart will protect System

2000 data bases from user program Abends and OS failures. With this facility, System 2000 will recognize any data base damaged by abnormal system or user program termination and initiate a back-out of the effect of all update transactions in process at the point of failure.

Where Am I?

Checkpoint/restart provides the PL/I message and batch program user with facilities to capture an image of the data base at any point during a program. The user or the data base administrator (DBA) may roll back to a predefined checkpoint and restart from there, MRI said.

As with save/restore and rollforward, the recovery facilities may be enabled and disabled for each data base, allowing the DBA to limit recovery logging to update sensitive data bases only, such as those supporting on-line data entry systems.

System 2000 is currently operational on IBM 360s and 370s under OS, VS1 and VS2; Univac's 1100 series under Exec 8; and Control Data Corp.'s 6000, Cyber 70 and Cyber 170 series under Scope, Kronos and NOS.

Currently the basic System 2000, of which Release 2.80 will be an update, is available for \$30,000.

MRI Systems can be reached through P.O. Box 9968, 78766.

On-Line Programming Supported by 'Taps'

NEW YORK — Users building on-line programs can do their work "largely independent of communications monitor, data base design and terminals used" by using the Terminal Application Processing System (Taps), according to the vendor, American Computer Software Clearinghouse, Inc. (ACSC).

Taps includes routines to handle those functions common to all on-line applications. It also has a data element dictionary which makes data file formats transparent to the user, a simplified macro language, a generalized batch mode on-line simulator and a facility for documentation generation, ACSC said.

Screens in Hours

User experience shows useful and usable CRT screen programs can be created in "a matter of hours" and reach production status on the first application in "approximately one-third the time originally estimated," the vendor claimed.

Taps works under all versions of IBM's CICS and the OS and VS versions of Tcam. The VS versions have been optimized to make most efficient use of the IBM paging algorithms, ACSC said. The "real" versions can reside in 48K bytes of main storage.

The package can be purchased for \$25,000 or leased for \$750/mo from ACSC at 2 W. 45th St., 10036.

Fortran Extended For DG Nova Users

VANCOUVER, B.C. — The Fortran Extended Subroutine Library from F.E.S.L. provides users of Fortran IV on Data General minis with byte/string handling, arithmetic including double-precision integer support and other operations including a facility the vendor labeled an extensive Cobol-type edit.

Use of the library routines can result in a 7K-byte reduction in program size because of more efficient I/O, the company said.

A permanent license is available for \$500 from F.E.S.L. through P.O. Box 48254, Bentall Station, V7X 1A1.

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| —Comprehensive diagnostic messages | |

ASI/INQUIRY has been fully operational for over six months, and is currently installed in multiple sites here and in Europe.

A number of seminars on ASI/INQUIRY will be held in major U. S. cities in the near future. Watch for announcement of the seminar schedule, and plan to attend the one near you. However, if you want to start answering "What if . . ." immediately, call or write today for further information.



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'Hidden' PL/I Option Optimizes I/O, Tests Indicate

Almost by accident, users stumble upon interesting and apparently useful options in their language processors.

In a letter accompanying this article, Souerwine said it "bothered" him that his IBM sales representatives "never mentioned the [Total] option's existence... Even after we became aware of [it], we could find very little on it in the IBM-supplied technical information support manuals.

"This experience makes me wonder how many more such enhancements are readily available and easy to use."

By David A. Souerwine
Special to Computerworld

In general, I/O tasks in PL/I programs are executed by library subroutines called from compiled code. We had heard, however, that the Total option in IBM's PL/I optimizing compiler can provide in-line code, under certain conditions, to opti-

mize these operations.

Being somewhat skeptical that the option would really impact I/O performance significantly, we devised a test keyed to data sets being accessed or created as consecutive, sequential and buffered. These are the standard default attributed for files declared as either input or output.

All tests were conducted on an IBM 370 Model 145 running under OS/VS1. To check out input optimization, a file with 50,000 records, 100 bytes each, was created on a 2314 disk drive with a block size of 3500. Both the "Move" mode (data transfer from external storage to the variable named in the read statement) and the "Locate" mode (data transfer from external storage to an input buffer through the use of a based variable) were

Concepts and Techniques

Move Mode	No Total		Total
	Mean	13.03 secs	7.20 secs
Locate Mode	95% Interval	12.16 to 13.90	6.73 to 7.66
	Mean	10.15 secs	5.32 secs
	95% Interval	9.84 to 10.45	4.57 to 6.08

tested using the input file declared with and without the Total option.

Each of the four combinations was executed eight times, with the mean and 95% confidence interval about the mean being determined for each combination. A program representing the pure overhead resulting from execution of file OPENS, file CLOSES, DO loops, etc. was run eight times, with the mean and confidence interval being determined for these runs as well.

At this point, using the statistical confidence intervals, the longest overhead was

subtracted from the fastest execution, and the shortest overhead was subtracted from the slowest execution for each combination. This process yielded a 95% confidence interval with the end points representing the best possible and worst possible execution times for each combination.

The "no Total"/Move mode is at least 100% slower than the Total/Locate mode, and possibly as much as 204.2% slower (mean indicates 144.9% slower). Even disregarding the Locate mode, the no Total/Move mode is at least 58.7% slower than the Total/Move mode and possibly as much as 106.5% slower (mean indicates 81.0% slower).

The remarkable fact is that, for a program using files with the above characteristics, there is no trade-off involved in declaring the file with the Total option. That is, this option is "free" to the programmer and does not necessitate changing any syntax or logic code.

The Total option cannot be specified for Vsam data sets, files reading Optical Mark Read data, or device-associated files. In addition, Total assumes no file attributes will be merged from any I/O statements or the OPEN statement.

Similar results were obtained in creating a file with 20,000 records, 80 bytes each, on a 2314 disk drive with a block size of 1680. The no Total/Move mode is 150% slower than the Total/Locate mode, on average. The no Total/Move mode is 86.1% slower than the Total/Move mode, on average.

Souerwine is marketing information systems coordinator for the Bausch & Lomb Soflens Division in Rochester, N.Y.



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Software House Backs CDC User

PITTSBURGH, Pa. — Users of Control Data Corp. mainframes can enhance the efficiency of some very specialized operations with one package from Cyber Associates, Inc. and improve the handling of one class of business problems with another.

The Program Optimization Package (POP), designed for the hardware capabilities of CDC 6000 series CPUs, consists of a polynomial evaluation routine and a simultaneous equation solver. Cybersort is a high-speed stand-alone or Fortran callable sort program, with report generating facilities.

The Polynomial evaluation routine within POP evaluates the wave front equation in less than 2 μ sec/term, the vendor said. The simultaneous equation solver requires no extra buffers and allows unpacked matrices, the spokesman added.

POP is particularly suited for use in all curve-fitting applications, he noted, adding that the routines in the package are available separately; the polynomial routine going for \$1,500 and the simultaneous equation solver for \$1,425.

Cybersort accumulates user-specified fields, takes subtotals and totals and prints all headings and footings.

The sort program, working in core or from file to file, allows an unlimited number of sort keys and subtotal fields.

This combination sort-report writer is available now for \$25,000.

Cyber Associates is at 3512 Fifth Ave., 15213.

Keane Observations

'80-Hour Rule' Backs Project Control

By Don Leavitt
Of the CW Staff

WELLESLEY, Mass. — Many DP managers regularly apply the principles of project definition, project responsibility, progress reporting and supervision of changes and trade-offs — but the projects still get in trouble.

This happens, according to a Keane Associates newsletter, because even with fairly well-known guidelines and checklists of key elements within a software project, there are also a number of potential "bull traps."

At the same time, however, there is a technique of productivity management the editor of *The Consultant* said works for Keane and should work for any software development group. It involves breaking any project into segments that should not require more than 80 hours of work to complete and reporting the status of each segment on a completed or not-completed basis.

Before detailing the "80-hour rule," the newsletter recognized the hazards of the "nonexistent resource" and the verbal "understandings" that aren't understood the same way by all parties involved.

Effectively, resources to continue work on a project are nonexistent if they are unavailable to the project member who needs them. Test time on a computer is

Concepts and Techniques

one of the best known examples of this situation, when scheduling of the system is out of the hands of the programmer waiting for a test shot.

But having user department personnel unavailable to create test data or to evaluate the results of a test shot — if in either case that support was part of the project plan — is an equally valid example of resources that are effectively nonexistent, Keane said.

It has become almost a commonplace to stress the need for written communication, but the newsletter added another pointer in that respect: reports should be prepared on a regular, continuing basis, even if a form is used and it is an exception report of items that have missed deadline.

On major projects, Keane recommended use of an objective third party who stands apart but maintains good working relationships and communications between the developers and the users.

Even written reports won't always avoid another problem — the subjectivity of project staff personnel in estimating the degree to which their particular assignments have been completed.

The classic approach — though invariably the wrong one, according to Keane — is to measure project progress by yardsticks, such as actual vs. budgeted man-days, or by the subjective best guess of the personnel involved.

These measures are too elastic, Keane

said, adding "a much more preferable technique is to remove all doubt from the measurement function by imposing 'all or nothing' rules on it."

The Concepts and Techniques pages are intended to serve as a clearing-house of ideas to make user programs — and the programmers themselves — more efficient.

Reactions to Souerwine's evaluation of the PL/I feature he "stumbled upon" are welcome, as are descriptions of other ideas readers have found helpful in their own coding efforts.

Contributions should be no more than 1,000 words long, and double-spaced, typed copy would be most appreciated.

With the "80-hour rule" every task in a system development, regardless of the size of the total system, can be quantified in measurable work units that do not exceed 80 hours of effort. Regardless of the nature of the task, it must be divisible into units of work not longer than two man-weeks, Keane said.

The virtue of the rule is obvious, the newsletter went on. First, it makes manpower assignments very straightforward.

Second, by segmenting large jobs into a string of small work units, it assures — at the outset of the project — a thorough and thoughtful step-through of every element in the total system.

Thirdly, it totally eliminates guesswork measurement. The task, at the end of 80 hours, is either finished or it's not.

"How applicable is the rule?" Keane asked rhetorically. Totally, it answered.

"In fact, one of the best measurements of the initial project work plan, and its orderliness and completeness, is to attempt to block it out into discrete work assignments not exceeding 80 hours each.

"With minor effort, you should be able to do it. If you cannot," the newsletter warned, "you are in for the type of project management problems that keeps fatalism alive and well in the software development profession."

Copies of *The Consultant* are available from Keane, 36 Washington St., 02181.

'Engineering' to Be Reviewed

NEWTON, Mass. — Software engineering means more cost-effective and reliable software through improved analysis, design and implementation, according to Dr. John W. Brackett, vice-president of Softech, Inc.

Brackett has developed a course designed to show managers how to increase programmer productivity through software engineering.

The two-day seminar will be offered by The Conference Co. in New York City Oct. 6-7 and in San Francisco Nov. 10-11.

Attention will be focused on the "high-leverage" areas, especially methods for

improving the analysis and design process. These are particularly important, Brackett said, noting a recent Department of Defense survey showed 64% of software errors stemmed from these areas.

The course is designed to familiarize technical managers with the software engineering methods available today, including structured programming, structured analysis (a Softech technique), top-down design, implementation and testing and new approaches to managing the development process, Brackett said.

The enrollment fee for each seminar is \$300. The Conference Co. is at 797 Washington St., 02160.

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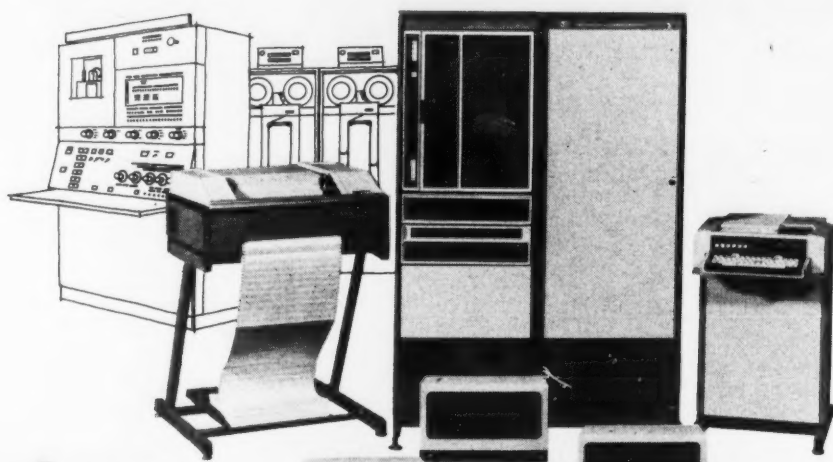
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Data Briefs

Syntech Modem Suited For Multivendor Nets

ROCKVILLE, Md. — The ESP-201 modem from Syntech Corp. is a Bell 201-compatible unit that is said to be especially suited to networks using more than one vendor's modems.

The ESP-201 automatically senses the interface requirements and provides the necessary response, the firm said.

For example, when switched to a dial line, it will automatically provide fast turn-around; when switched to an auto-dial line, it will automatically provide the answerback tone; or when switched to a Bell modem, it will automatically provide the necessary handshake interface.

Additional features include built-in diagnostic testing, data quality indicator, status indicator lamps, manual busy-out switch and a call abort timer.

The ESP-201 costs \$1,350 or \$67/mo on a two-year lease with deliveries beginning in November from the firm at 11810 Parklawn Drive, 20852.

DCS Adds Short-Range Sets

DANBURY, Conn. — Data-Control Systems (DCS) has introduced two short-range data sets intended for large facilities or campuses where twisted-pair cabling is available.

Transmission ranges of up to 10 miles are possible, depending on wire size and data rate, the company said.

The SR-200, a synchronous data set, will operate at speeds of 2,400-, 4,800- and 9,600 bit/sec and 19.2 bit/sec. It provides all the necessary clocking signals for operation with synchronous data terminal equipment.

The SR-100, an asynchronous data set, will operate to 1,000 bit/sec.

The SR-100 and SR-200 can operate in either a point-to-point or a multipoint environment. An additional cost savings can be realized because both units will operate at full and half duplex in a four-wire network.

The SR-100 costs \$300 and the SR-200 costs \$500 from the firm at P. O. Box 584, 06810.

Paperless Claims Net Gets Data at Source

JACKSONVILLE, Fla. — Blue Cross of Florida, Inc. and Blue Shield of Florida, Inc. have developed a "paperless" claims-processing communications network which involves collection of data from originating sources.

The network includes a central DP facility at the groups' corporate offices here, a network of data terminals installed at offices throughout the state and a configuration of pollers and communications adapters which serve as interfaces between the data terminal network and the central facility.

"This new data communications network is a vast improvement over our previous admissions and data collection systems, and we estimate substantial savings will result," according to Cecil Rivers, vice-president of DP for Blue Cross and Blue Shield.

"With an expected volume of over 12 million claims by 1978, this system will make an important contribution to holding down future costs of services provided by our Blue Cross and Blue Shield of Florida plans," he added.

The terminal data-capture process now allows information to be entered and edited off-line at the source and transmitted at high speed to Jacksonville. By reducing admissions and claims-processing time by as much as eight days in some instances, the system enables the medical plans to speed claims payments to patients, hospitals and physicians.

Two-Year Search

"We studied data terminals and companies manufacturing them for two years before making our decision. Ultimately, we determined we needed terminals that were capable of meeting our system requirements in terms of data input/output and transmission... terminals that naturally complemented hospital and medical office environments," C.R. Scott, director of DP planning for Blue Cross, said.

"They had to operate as quietly as possible and, at the same time, be compact in size... and, of course, we needed terminals that were low in cost, since we were talking about a rather siz-

able capital investment," he said.

After several months of careful evaluation, Blue Cross and Blue Shield selected Texas Instruments (TI) to install several hundred of the Silent 700 data terminals in hospitals and doctors' offices throughout the state. TI is also installing a number of its Model 960 minicomputers in Florida to serve as polling systems and communications adapters between the Blue Cross/Blue Shield central IBM 370 mainframe and remote locations.

The terminals use a quiet thermal printing technique, an important feature for hospital environments as well as medical offices. They fit into the existing data communications network with switch-selectable data printing speeds of 10-, 15- or 30 char./sec and data transmission speeds ranging up to 120 char./sec.

Questions and Answers

For hospital communications, TI replaced a network of mechanical teletypewriters with some 200 Silent 700 Model 733 automatic send/receive (ASR) (Continued on Page 30)

For Local Forms Control

Incoterm System Emulates IBM 3270

NATICK, Mass. — Incoterm Corp. has developed an enhanced software emulator for local forms control that operates on its IBM 3270-compatible SPD 20/20 terminal system.

The emulator provides the SPD 20/20 with more features at lower cost than the IBM 3270, Incoterm said.

Primary emphasis of the system is on maximizing the efficiency of local forms and data storage while minimizing the core requirements for new programs and disk buffers, a spokesman said. He described the system as compatible with IBM 3270 data communications protocol, but said it offers extended data entry capability.

Designated the SPD 20/20 LFC, the system operates at speeds from 1,200- to 9,600 bit/sec with no modifications in software. It consists of a termi-

nal processing unit with 32K core memory, up to eight SPD 20/20 display terminals, up to three dual diskettes, a cyclic check controller, synchronous communications controller and either P-100-2 (100 char./sec) or P-165B-2 (165 char./sec) printers.

The SPD 20/20 LFC system operates under the SPD/DOS diskette operating system which resides on the system disk. At installation and initialization time, the program object file and the files for the forms directory and forms storage are configured under DOS to reside on the system disk.

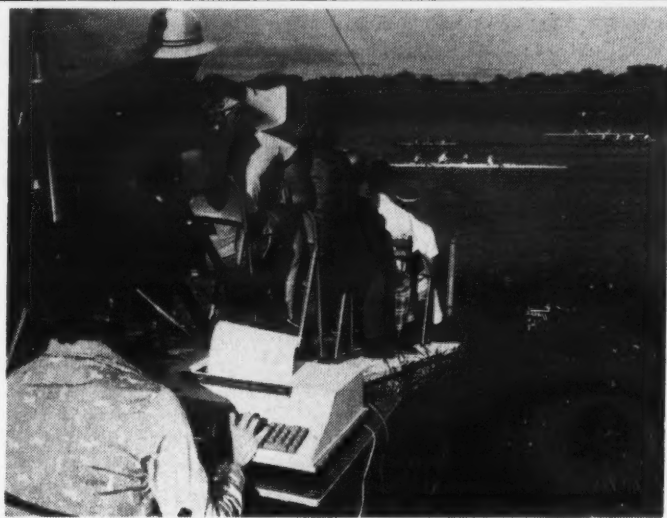
The data files and their directory are configured as DOS data files and are assigned to disks other than the system disk. This permits replacement of the data disks for unlimited off-line temporary data storage.

All forms and data storage utilize the standard Ascii character set regardless of the code specified for the 3270 communication discipline, the company said.

A typical system with six CRTs, a dual-diskette drive, a terminal processing unit with 32K of storage, communications controller and 165 char./sec printer costs about \$34,915, or about \$5,469 per terminal.

A comparable six-terminal 3270 system costs about \$54,388, or \$9,065 per terminal, which makes the Incoterm system about 36% less expensive than the IBM 3270, an Incoterm spokesman said.

The Incoterm system is \$1,085/mo on a three-year lease. First deliveries are scheduled for early 1976 from 6 Strathmore Road, 01760.



Terminal Ahoy!

PRINCETON, N.J. — Oarsmen at the recent U.S. team trials here for the World Championships were able to view their relative positions during the race from computer-generated output.

The printout depicted where each boat was in relation to the other boats during each of the 500-meter points of the race, as well as the split times.

The system, designed by Kent Mitchell, a former Olympic coxswain, utilized a portable terminal, a digital clock and a remote central processor.

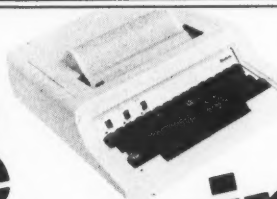
Buttons punched by volunteer timers at the start and at each 500-meter interval of the 2,000-meter race transmitted signals to receivers tuned for each lane.

The receiver closed a switch which signaled the clock to record the elapsed time and to display the digital time to the nearest 1/100 of a second.

Times for each lane were then fed to a Hewlett-Packard computer through a Computer Transceiver Systems portable terminal and computed results were printed out.

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'Paperless' Claims Processing Starts With Source Data Capture

(Continued from Page 29)

twin magnetic tape cassette data terminals, which were placed in hospitals. These terminals met all the criteria established by Blue Cross, including compatibility with established operating procedures for data entry and transmission of hospital admissions information.

In effect, the process is a question-and-answer sequence. A format tape "asks" the same questions that appear on a Blue Cross admissions form, which the hospital clerks use as source information for keying admissions data into a local data terminal.

As admissions data is entered at the remote location, the entries are stored on a cassette. After business hours, the operator switches the terminal on-line.

Then, when the polling units in Jacksonville call the local sites, the terminals automatically answer and transmit the day's admissions information to the corporate headquarters over voice-grade phone lines. The polling system passes data to the computer for processing, which occurs immediately, and subsequently transmits a response to the originating terminal.

Transmission errors have been minimized and downtime has been noticeably reduced, compared with that of previous equipment. The magnetic tape procedure of the terminal enables operators to correct errors in a fraction of the time previously required, Scott said.

The TI Model 742 programmable data terminal was selected for installation in doctors' offices to collect data directly

from originating sources.

The operating procedures for this terminal are essentially the same as those for the terminals used in the hospital communications network.

Another phase of the paperless claims processing network is the in-house data

Terminal Transactions

entry portion, which will eventually be installed in the corporate headquarters in Jacksonville. This portion will also use intelligent programmable terminals providing source-editing capabilities.

Model 340 Version Designed for Minis

ANN ARBOR, Mich. — Sycor, Inc. has introduced a version of its Model 340 intelligent terminal — with an Ecma/Ansi-compatible cassette recorder — designed primarily to interface with small business computers.

The Model 340-E is functionally the same as the company's earlier Model 340 terminal.

The Model 340-E with its Ecma/Ansi-compatible recorder features a read-after-write head for improved data throughput, a data capacity of 2,000 80-character records or 950 256-character records on 280 feet of cassette tape and an error rate of less than one error in 10^9 bits.

The Model 340-E terminal uses a phase-encoded recording technique and may write on both sides of the tape cassette, thereby increasing the storage capacity from 240,000 characters

per tape to 480,000 characters.

Users of the NCR 399, the Honeywell Series 60 and the Litton 1300 small business system should be particularly interested in the data entry and preprocessing capabilities of the Model 340-E, a Sycor spokesman said.

Options on the terminal include a flexible disk recorder, four speeds of printers, three magnetic tape drives, card readers and both asynchronous (110- to 1,200 bit/sec) and binary synchronous (1,200- to 4,800 bit/sec) communications.

The Model 340-E with one recorder is priced at \$216/mo on a one-year lease and \$184/mo on a two-year lease; both prices include maintenance. The purchase price of the Model 340-E is \$7,800. Deliveries are expected in the fourth quarter from 100 Phoenix Drive, 48104.

Schools to Get Cut On Price of Portacom

STAMFORD, Conn. — Dataproducts Corp. will offer schools a special 5% price reduction on its portable typewriter terminal, Portacom.

By discounting the price of the \$1,495 data terminal to \$1,420, the firm hopes to position Portacom well within the range of most public school system budgets and encourage greater use and interest by secondary school students in computer use, a spokesman said.

The 31-pound data terminal comes in a briefcase and features an Ascii keyboard, separate numeric key pad, RS-232 connector, built-in acoustic coupler, an impact printer that uses ordinary paper, switch-selectable parity and full- or half-duplex.

Delivery of Portacom is 30 days. Dataproducts Telecommunications Division is located at 17 Amelia Place, 06904.

FEC 772 Display Offers

Alternative to IBM 3277-2

HOUSTON — The Model 772 display station from Financial Electronics Corp. (FEC) is described as a plug-to-plug replacement for the IBM 3277-2.

In addition, the Model 772 offers a home cursor key, capability to display both upper and lower case, input field identifiers, operator-selectable attribute character display and generation for display format composition and debugging and block cursor.

The Model 772 plugs directly into the same cable from an IBM 3271-2 or 3272-2 controller that is used for an existing 3277-2 display station. Model 772s can also be operated together with Model 3277-2s on the controller, FEC stated.

Priced at \$3,800, the terminal is available from the vendor at 9730 Town Park Drive, Suite 101E, 77036.

THE NEW SYCOR 440



SI
SYCOR INC.

'Cash Plus' Lets Customers Combine Shopping, Banking

MILWAUKEE — Since the beginning of this summer, nearly half a million savings and loan customers here have been able to process bank transactions directly from local grocery and department stores.

A Jewel Food Store on the west side of the city was the first store to go on-line with 21 savings and loan associations corresponding through the computer system of the Midland National Bank here.

Called "Cash Plus," the system works through Remote Service Units, Ltd., (RSU), a service company set up by the savings and loan associations in cooperation with the Midland National Bank, Wisconsin Jewel Food Stores and Copp Department Stores.

"Cash Plus gives savings and loan customers regular passbook accounts the convenience of being able to complete transactions while doing their regular shopping," Gerald Levy, president of

RSU and also president of Guaranty Savings and Loan Association here, said.

"In addition, it greatly extends the hours the customers can do business with their savings and loan associations. Their accounts are now accessible 80 hours a week, during the stores' regular business hours, instead of the 42 to 46 hours the savings and loan associations are open," he said.

The service also gives savings and loan customers the ability to earn interest on their accounts right up to the moment funds are transferred, he added.

Cash Plus Customers

The savings and loan customer whose application for Cash Plus has been accepted receives a plastic account card with a magnetic stripe on the back that has been encoded with his account number and identification.

To access his account, he simply hands



Attendants at supermarkets and other retail service desks have been trained to handle a full range of account transactions using NCR 279 terminals linked directly to Midland National Bank's Burroughs 3700, which services the 21 participating savings and loan associations.

the card to the store's service desk attendant, who inserts it in an NCR 279

terminal. The customer then uses a remote keyboard to punch in his own personal identification number (PIN) which is known only to him.

The terminal calls up his account at his savings and loan association through Midland National Bank's Burroughs B3700. Leased lines and Bell modems now link 12 NCR terminals in 12 stores to a Varian front-end processor, which in turn controls transaction traffic coming into the mainframe.

If the card holder makes a mistake in keying in his PIN, the computer will refuse access to the account, but will allow a second chance for entry of a correct identification code. Should the customer continue to key incorrect numbers, the account cannot be accessed and the attendant will retain the card.

Thus, the system provides the necessary safeguard against anyone overhearing the number, as is possible in the case of audio

Clustered data entry and concurrent processing with shared files...\$677 a month.

The Sycor 440 System:
the newest addition to
our family of compatible
intelligent terminals.

Our new distributed processing system lets you perform data entry and inquiry/response concurrent with background processing. So you don't need multiple systems to do multiple jobs. At \$677 a month (for four keyboards, communications, cassette, and a five mb disk on a three year lease, with maintenance) you can perform all these functions—plus many more you never thought possible at such a low price.

Intelligent data entry.

You can save time and money by catching operator errors as they happen, prior to transmission to the central computer site. And reduced errors mean greater operator productivity, lower communication costs and reduced mainframe processing.

Field editing. As soon as you get the system, you can implement our basic data entry package. Without any fancy programming.

TAL II. To extend the 440's power, use our new data entry language, TAL II. This easy-to-use, high-level language lets you customize data entry programs. Instructions are also provided for arithmetic operations, conditional data entry, range checking, table look-up, equal/compare and a host of other intelligent features.

Shared file access.

The 440 system lets you share and access files locally, reducing investments in telephone communications and central CPU resources.

Data entry made easy. Now

each operator, at her own display, can make use of current data in shared files to support data entry functions. For reduced keystrokes and lower error rates.

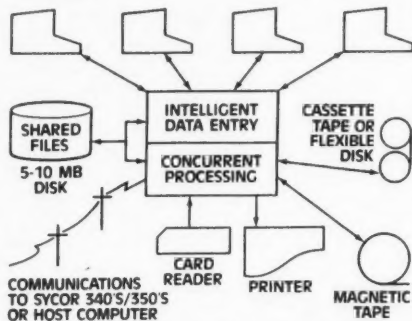
Inquiry/Response. File look-up is made simple with up-to-date information on-site, using the 440's own file management and disk storage capabilities.

System modularity.

Design your own system with a variety of options and peripherals.

Supports from 1 to 8 displays.

Each is controlled by the Sycor processor and is capable of performing tasks independent of other displays.



Choice of 5 and 10mb disks.

Store and retrieve programs, shared files, and data at remote locations.

Wide variety of peripherals.

And to complete our system configuration, choose from matrix and line printers, computer-compatible tape drives, card readers, and a variety of communications options.

Compatibility.

There's full software compatibility with our Model 340 and 350 stand-alone terminals. Keyboards are also compatible.

Programming. One program fits three different systems—340, 350 and 440.

Communications. Communicate with the mainframe, emulating IBM 2770, 2780 or 3780 protocols. Or use the 440 as a polling station at your central computer site to receive and transmit data to remote 340s, 350s, and 440s.

Concurrent processing.

And best of all, while data entry is being performed in the foreground, you can be doing other jobs concurrently in the background. Jobs that can save you time and money. Jobs like:

Remote job entry. Use the 440 with its card reader and 300 LPM printer for large-scale remote job entry. And since the system contains a CRT and a keyboard, you don't pay extra for them.

Multi-terminal printer support. Each display can interleave print data to one printer as the data is being entered. So, you don't need a separate printer for each display.

Report generation. Sycor-provided programs let you produce all sorts of management reports—sales analysis, inventory, or billing—at the same time as you are performing data entry.

File maintenance. And the Sycor 440 allows you to do editing, sorting, updating, and file transfer in a background operation.

The lowest-priced distributed processing system.

When you consider all the advantages of our 440 system, and then consider its low monthly cost, we think you'll agree: it's the best system in the industry.

For more information on the new Sycor 440, or any of our other intelligent terminal systems, contact your Sycor representative, or write our corporate offices.

SYCOR

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Terminal Transactions

systems, or of anyone making use of a lost or stolen card.

Once the account has been accessed, the attendant keys in the transaction as written on a deposit/withdrawal slip filled in by the customer, and the money exchange is completed. The card, along with a written record of the transaction, is then returned to the customer.

Simplicity, Speed of Operation

RSU selected the NCR 279 terminal on the basis of its simplicity and speed of operation, along with the confidentiality of the PIN and the hard copy of the transaction it provides, according to Levy.

"There is also a fail-safe feature in a magnetic tape cassette that captures transactions in the event telephone lines or the computer are down," George Dalton, vice-president of Midland, explained. "In this way, the service desk in the retail outlet is able to conduct business as usual, even if a portion of the system is not in operation."

Still another feature Dalton feels will be useful to many merchants is the fact the terminal need not be totally dedicated to the Cash Plus system, but provides the merchant added utility of unassigned keys that might be used for other transactions. Many stores and savings and loan associations can thus provide such services as payment of utility bills or the purchase of money orders.

The result of the first weeks on-line with the program have been encouraging to the savings and loan association members, Levy said.

"We have already had a considerable amount of activity and have generated a great deal of interest," he said. "We look

(Continued on Page 33)

Photographed on location in Las Vegas, Nevada.



**You don't have to go to
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All this for just 6¢ a month, considering the 20-year warranty.

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**GRAHAM
MAGNETICS**

Graham, Texas 76046

Reallocates Materials

Net Controls Steel Plate Facilities

PORT KEMBLA, Australia — An Australian steel works uses on-line data communications to monitor and annually reallocate more than 15,000 tons of plate without taking individual plates off the production line.

Australian Iron and Steel Pty. Ltd. (AIS) employs a network of some 80 terminals to provide on-line control for its flat products facilities here. Last year the group produced more than three million tons of steel plate, strip and tinplate.

By constantly monitoring its plate mill and finishing lines via terminals, AIS is ensured an uninterrupted production flow despite changes in steel plate characteristics that may occur during the processing of a particular order.

Whenever a plate with order-differing specifications is produced, the terminals communicate these new characteristics to one of two central-site Control Data Corp. 3500s. The mainframe then searches its file of up to 25,000 customer orders for one that requires a plate meeting the changed specifications and sends the new order allocation back to the terminal located beside the finishing line. The plate is reallocated to the new customer.

This process is completed in less than 10 seconds, thus allowing continuous production of plates with varying characteristics for different customer orders, without removing plates from the production line.

The system, installed in January 1974, reallocated its 25,000th ton last July. Over 17,600 tons were reallocated for the 12 months ending in May, according to R.A. Hardy, manager of systems and data processing for the firm.

In addition to a significant improvement in plate yield, Hardy noted, cash flow is optimized now that material does not have to be stocked and rehandled when finishing line capacity becomes available.

The system has also improved "starting point" yield, that is, automating production planning used in producing the plate rolling schedule, Hardy explained.

AIS developed the reallocation and other real-time production control opera-

tions using two CDC 3300 computers and on-line communications terminals installed throughout the Port Kembla Works since the late 1960s. The upgrade to the dual 3500 systems was completed last month.

The company also operates a remote batch terminal connected to the CDC 6600 computer in CDC Australia's Cybernet center in Sydney to support its off-line DP requirements.

AIS plans to increase the number of terminals in its network by installing two Digital Equipment Corp. PDP-11/40 minicomputers to perform front-end message switching and line control functions. The systems will link the central-site 3500s with computers and terminals now in and planned at the plant. The overall system was designed for more than 98% real-time communications availability.

One for Two

MT. LAUREL, N.J. — Spectron Corp. has a modem eliminator, the ME-81, that permits direct connection between terminals and computers without the need for modems.

It is intended for applications where transmission over short distances would otherwise require two modems connected back-to-back.

An Identical Interface

One ME-81 replaces the two modems. The unit presents an identical interface to the business machine as a modem and operates at speeds up to 20 kbit/sec over a distance of 50 feet.

The clock frequency and Clear to Send delay are specified by the customer.

Price is \$240 from the firm at Church Road and Roland Ave., 08057.

Tech Control Module Added to Cooke Line

ALEXANDRIA, Va. — Cooke Engineering Co. has added another module to its line of Dynapatch and Dynaswitch data communications tech control modules.

The unit is a combined programmable digital fallback switcher with four-wire VF signal patching. This feature is said to permit retouring signals for 16 channels at the digital and analog sides of modems.

The unit handles 16 full-duplex EIA RS-232C digital channels and 16 four-wire VF channels, the company said.

In the digital interface, the unit provides patching and programmable "fallback" switching of individual channels or all 16 channels as a group, the company added.

Prices are \$4,500 (\$281 per channel) when equipped with 12-circuit Dynapatch EIA jacks and \$4,775 (\$298 per channel) when equipped with 16-circuit Dynapatch jacks. Delivery is 30 days from the firm at 900 Slaters Lane, 22314.

'Cash Plus' Allows Shopping, Banking

(Continued from Page 31)

for Cash Plus to be a real boost to the savings and loan business."

Social Security Funds

"Direct deposit of Social Security funds, for example, which did not look too good for savings and loans in tests in Georgia last spring, is quite feasible through electronic funds transfer systems (EFTS)," Levy noted.

RSU members are not alone in their enthusiasm for Cash Plus; the merchants involved are equally pleased with the system.

Among advantages to the merchants, "Cash Plus has allowed us to provide an added service to our customers on a one-stop shopping system, in addition to broadening our own customer base with some 500,000 savings and loan customers who are potential Cash Plus users," Robert Neslund, vice-president of Jewel Food Stores' Wisconsin Division, said.

Still another advantage to the merchant, he noted, is the guaranteed check feature built into the system. Since checks are deposited to and cash is withdrawn from depositor savings accounts, the store has no liability for checks processed against the Cash Plus system.

"As the system gets underway, it should reduce our cash-on-hand requirements, particularly on paydays," he said. "And should a bad check be presented, it is the responsibility of the savings and loan associations, not the store."



Why the last five years saw us grow from 2 units in place to 12,895 in a field that's as competitive as they come.

In the data terminal business, it takes more than a great product to produce that kind of upward motion.

It also takes a combination of instant response and superior service.

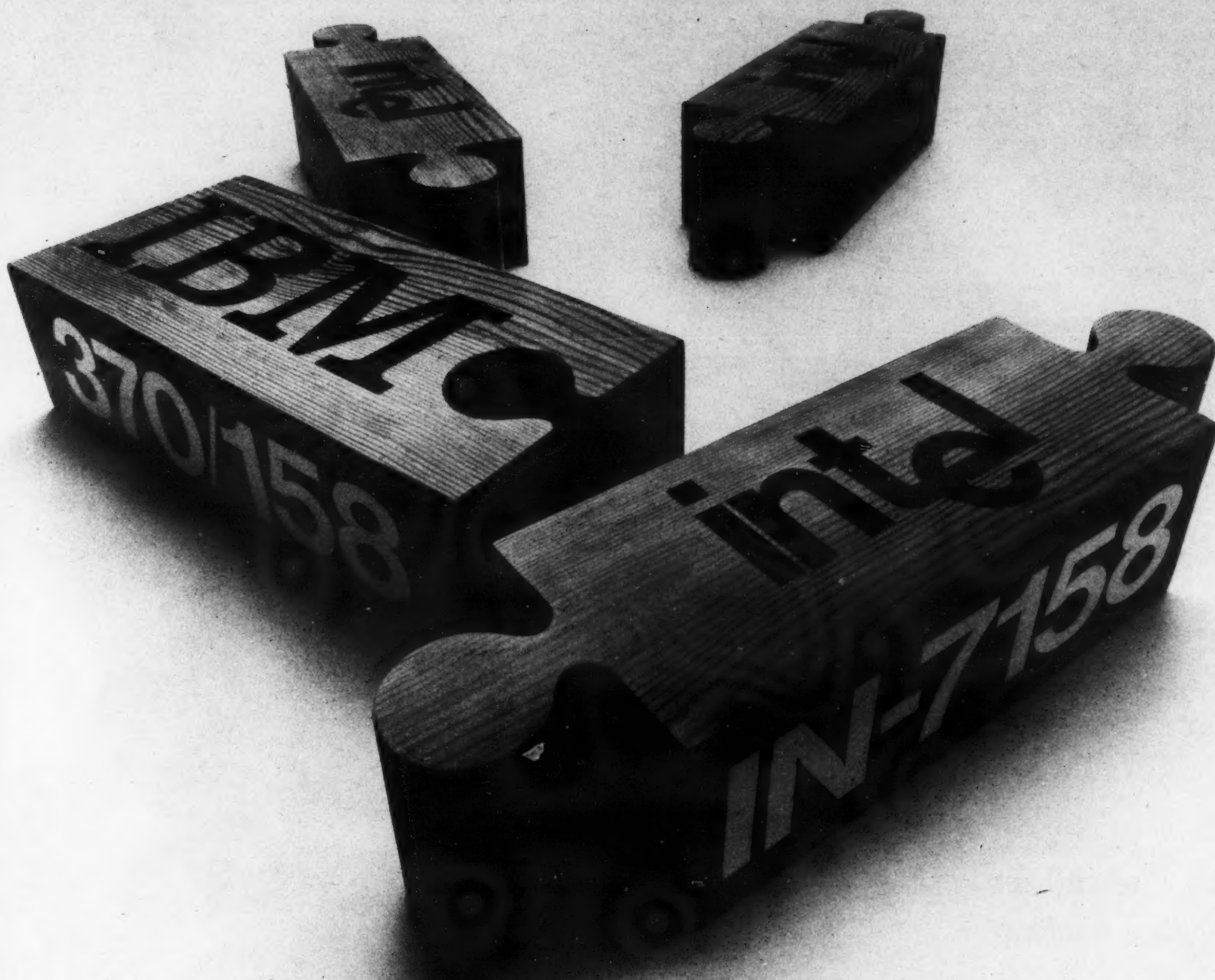
That's why TCI is not just growing, but growing fast. From ground zero in 1969 to 355 units placed by 1971, 3,540 by 1973, 12,895 by 1975. And we've grown in the face of stiff competition. By developing, making and servicing quality data terminals and other communications equipment. Tailored to the needs of users like hotel and motel systems. Medicine. Trucking. Insurance industries. With a demonstrated willingness and ability to customize equipment for special needs.

More evidence of our growing power: a service network that now has people in more than 90 cities. And service is coordinated from our Raleigh headquarters, so any problem gets 24-hour attention.

All of which makes TCI pretty unusual. Fast and flexible, yet stable and reliable. With the solid backing of a \$3.3 billion blue chip corporation. All of which makes us a company with what it takes to keep right on going. And growing. Terminal Communications Inc., 3301 Terminal Drive, Raleigh, North Carolina 27611.

TERMINAL COMMUNICATIONS INC.

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Put two good names together.

IBM means computers. Intel means semiconductor memories. We've been leaders in semiconductor memories and microcomputers since the beginning. While becoming the largest independent manufacturer of semiconductor memory systems in the world and making headlines with our 4K RAMs and computers on a chip, we have also been quietly building a reputation in the IBM add-on memory business.

Until now all our IBM add-on systems have been sold through others under private labels. Now they may be leased or purchased directly from us with direct service.

For IBM 370/158 users, there's the Intel IN-7158. This system is built with Intel 4K RAMs making it the most reliable system available today and capable of

expansion to 8 megabytes in a single frame. That's twice as much as is available from anyone else. Memory can be expanded in 1/2 megabyte increments up to 4 megabytes and in 1 megabyte increments from 4 to 8 megabytes.

As an added feature an Intel microcomputer has been built into the system to control the "intelligent" maintenance panel, monitor memory system status and automatically track system performance.

We have also delivered memory for the 370/135 and 370/145. All of our IBM add-on memory systems offer savings in space, cooling, power and cost. For more information call any Intel sales office listed below or write: Intel Memory Systems, 1302 North Mathilda Avenue, Sunnyvale, California 94086, (408) 734-8102.

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Bits & Pieces

Microform Readers, Printers Listed in Auerbach Report

PHILADELPHIA, Pa. — The "Auerbach Guide to Microform Readers and Reader/Printers" describes the capabilities of different vendors' devices, provides interviews with current users and offers comparative analyses.

The guide includes a tutorial and market overview report on microform readers, reader/printers and enlarger/printers; in addition, it offers advice on how best to match user needs with the proper equipment, Auerbach said.

A search chart lists about 200 devices from some 60 manufacturers. There are technical reports on about 45 readers, reader/printers and enlarger/printers.

The guide costs \$19.95 from the firm at 121 N. Broad St., 19107.

Dymat Offers Portable Fiche Reader

SANTA MONICA — Dymat Photomatrix Corp.'s Model 600 microfiche reader is a portable table-top with high-resolution optics and uniformity of screen brightness that keep eye strain to a minimum, according to the firm.

Other features include variable light intensity and a ball slide X-Y platen for easy movement while maintaining track control in selection of rows and columns.

The reader costs \$1,500 from the firm at 2225 Colorado Ave., 90404.

Unit Converts IBM Cards

JESSUP, Md. — Digi-Data Corp. has introduced a system which converts IBM magnetic cards to 9-track, 800 bit/in. computer tape.

Data is transferred at 50 char./sec with the IBM magnetic card reader in the "skip" position.

Purchase price is \$4,000; twelve-month lease is \$185/mo.

The firm is at 8580 Dorsey Run Road, 20794.

Data View Reduces Viewer Costs

MENOMONEE FALLS, Wis. — Data View, Inc. has reduced the price of several of its microfilm viewers and accessories.

The firm's Model 760B (3/4 computer output microfilm viewer) now costs \$159, down from \$185, and the Model LF-1011 (1-1/2 page) costs \$175, down from \$185.

The Model LF-1015 (2 page) is now \$229 rather than \$245; and the Model LF-1018 (2-1/2 page) is priced at \$259 rather than \$305.

Data View is at P.O. Box 537, 53051.

Uses Xerographic Techniques

Users Laud Off-Line Unit's Print Quality

By Edith Holmes
And Patrick Ward
Of the CW Staff

Two users of the Xerox 1200 high-speed xerographic printer have reported improved print quality and throughput over the impact printers they had used before.

Both users also mentioned minor cost savings over impact printing, but said that was a secondary benefit.

Neither user was worried by Xerox's departure from the mainframe scene [CW, July 30]; they view the 1200 as a copier product and expect Xerox will now be able to concentrate on that product line.

Xerox introduced the 1200 in 1973 in a move that combined the firm's copier and computer technology. The 1200 has its own internal minicomputer and provides off-line, nonimpact "xerographic" printing from industry-compatible magnetic tapes.

The system prints on unsensitized 8-1/2-in. by 11-in. paper at the rate of one page per second.

Both the page size and printing speed were important points to Selling Areas

Marketing, Inc. (Sami) when it chose a printer last year.

The company generates some three million pages of market research reports each month for clients that manufacture products sold in grocery stores, according to Dan Minter, an administrative assistant with the firm.

It was this heavy and growing print load, combined with the need to get the information to the clients quickly, that caused Sami to choose the Xerox 1200, he said.

"Printing monthly marketing reports had required as much as 450 hours of impact printing and 1,900 hours of duplicating and reducing time on computer forms printers each month," Minter said.

"We hoped the 1200s would reduce total throughput time by several days," he added.

Five Xerox 1200 printers were scheduled to replace seven Xerox 2400 impact printers in July 1974, but various snags slowed the installations.

"We were one of the first customers to take delivery of the 1200 and we experienced a lot of mechanical problems,"

Minter said. "But Xerox got those squared away reasonably fast."

"Sami's current total of six Xerox 1200s have allowed us to maintain our delivery schedules even though print volume is increasing," he said. The 1200s have also given the firm added capacity for other applications that require about 500,000 pages per month, he noted.

The 1200's 8-1/2-in. by 11-in. output costs Sami less than 1 cent/page. The bond paper used is price-competitive with continuous form paper, he added.

"Our clients were just delighted when we went to the 8-1/2-in. by 11-in. paper. It's easier to store and handle, and the print quality is absolutely superior to what we were experiencing with impact printers," he said.

Setup for different printing jobs is easier than in impact printing, Minter said. The overlays for producing differing forms are made up and changed easily, he commented.

The printer operator just punches a couple of buttons to control the job definition language — the equivalent of the carriage control tape in an impact printer, he explained.

Quality the Goal

High print quality was the goal of a large East Coast utility when it replaced several impact printers with Xerox 1200s last year.

"We have high volume, more than two million pages a month, and we wanted better control of the printing operation and a cleaner and more timely product," the manager of DP equipment planning said.

The Xerox 1200 provides a third copy as good as the first and avoids the time-consuming bursting and decollating stage, he said. The paper size also makes binding reports more practical, he added.

Job setup is easier and, as an off-line device, the 1200 allows the operator complete control over his environment, he said.

The single paper size and use of overlays simplifies forms control and storage, he said.

Use Requested

"All of our objectives — better control, better use of forms and better user satisfaction — have been met," he said. One measure of the system's success is that corporate users have asked the utility's DP shop to produce their particular reports on the 1200 system.

The anonymous user did indicate "the 1200 had the normal problems of a new piece of equipment being introduced. This is a mechanical beast," he remarked.

"Reliability and maintenance have been satisfactory," he concluded.

Key-to-Disk Users Satisfied, Don't Plan to Switch: Datapro

DELRAN, N.J. — Users of key-to-disk and key-to-diskette data entry equipment are generally well satisfied with their systems and fewer than one out of five plan to change to a different method of data entry.

Conversely, more than half of the users of keypunch, key-to-tape and key-to-cassette devices are planning a switch to other data entry techniques, according to a survey by Datapro Research Corp.

The survey drew response from 400 users with 823 data entry devices and systems representing a total of 6,684 keying stations.

They were asked to rate the overall performance of each data entry device or system they were using.

By assigning a weight of 4 to each user rating of excellent, 3 to good, 2 to fair and 1 to poor, Datapro calculated the following weighted average user ratings for each class of equipment: key-to-diskette, 3.8; key-to-disk, 3.5; 96-column keypunches, 3.4; 80-column keypunches, 3.2; key-to-cassette, 3.0; key-to-tape, 3.0; and on-line data entry, 3.0.

Another question asked the users to report any plans for changing to a different type of data entry equipment.

Among the users of key-to-diskette units, 11% plan to switch to on-line data

entry, 4% to key-to-disk systems and 4% to other methods; 81% plan no change.

Keypunch users reported the following changeover plans: 26% to key-to-disk, 17% to on-line data entry, 12% to key-to-diskette, 4% to key-to-tape and 2% to other methods. But 46% of the keypunch users plan no change, Datapro said, adding the percentages total more than 100 because some users plan to utilize two or more input techniques.

Among the users of key-to-cassette units, 42% plan to switch to key-to-diskette, 8% to key-to-disk and 8% to other techniques; 42% plan no change.

Among users of single-station key-to-tape recorders, 30% plan to change to on-line data entry, 18% to key-to-disk, 16% to key-to-diskette and 2% to other methods. Only 36% of the key-to-tape users plan no change.

The survey results, together with the user ratings earned by more than 40 popular data entry devices and systems and an analysis of the responding users' data entry workloads, were included in the July supplement to *Datapro 70*.

Among the users of shared-processor key-to-disk systems, 13% plan to change to on-line data entry, 1% to key-to-diskette units and 4% to other input techniques; 82% plan no change at all.

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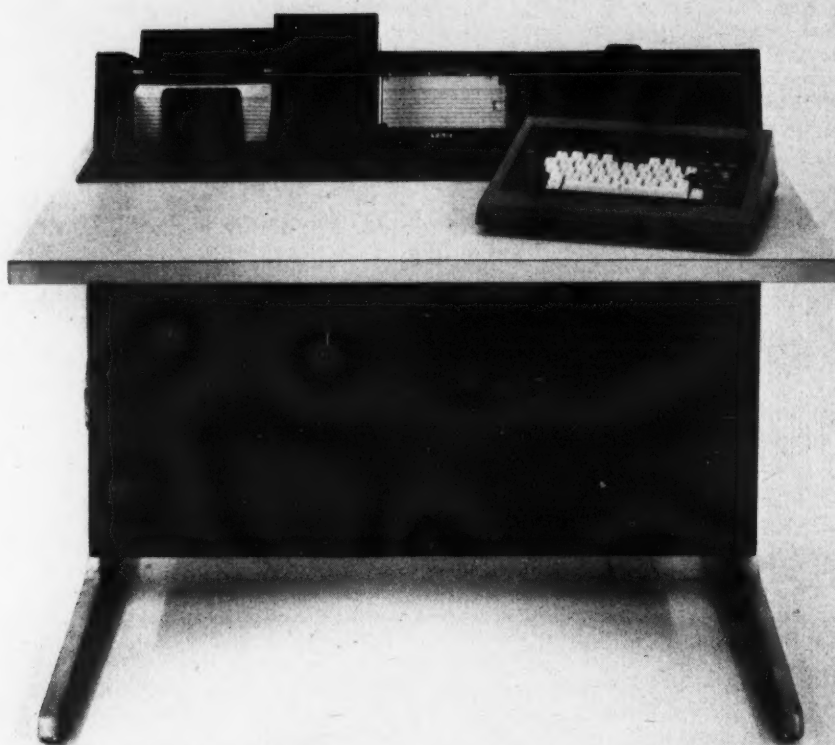
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Combines Beehive Terminals, Nova

Tesy Edits Text of Optically Scanned Typewritten Data

ST. LOUIS — The Terminal Editing System (Tesy) from Electronic Keyboarding, Inc. (EKI) utilizes multiple Super Beehive terminals hard-wired to a Data General Nova to edit, update and store text material captured through optical scanning of typewritten documents or entered on IBM-formatted magnetic tapes.

The Nova in Tesy is normally supported by a 25M-byte IBM-type moving-head disk, an industry-compatible 9-track magnetic tape, a 1,000 line/min. electrostatic printer and a computer console, EKI said.

Translates to Ascii

The system translates the original data code to Ascii and creates lines of text, with 70 characters on each, including spaces. Tesy recognizes special formatting control characters for such operations as paragraphing

Microdisc Gets Mag Tape I/O, Software Option

ST. PAUL, Minn. — Minnesota Mining and Manufacturing (3M) has added a magnetic tape input/output unit and a software option to its Microdisc parameter-search microfilm retrieval system.

The input/output unit permits computer- or keyboard-generated data on tape to be written onto the disk storage in the Microdisc system. The I/O unit is especially suitable for input of index data stored on a host computer, facilitating the search of blip-coded film cartridges produced by a computer output microfilm (COM) device, 3M said.

Used in an output mode, the tape unit can create tapes from which COM units produce film indexes to retrieve older documents in the file.

Scans Indexes

The interpolative search module allows scanning of long lists of index data to determine the microfilm frame on which a desired item is located. The terminal index reference for each frame is stored in the Microdisc memory, and the system indicates that a desired item (falling between two such references) must be on a specified microfilm frame.

The Microdisc system consists of a minicomputer, disk storage unit, CRT terminal and page reader/printer. The system enables the user to search for specific frames of microfilmed data by their content parameter.

While this usually involves locating frames on 16mm roll film cartridges, the unit can also supply lists of microfiche frames containing a specific type of information, 3M noted.

The input/output unit costs \$20,500 and the software module \$4,250. The Microdisc system itself costs about \$67,000. Rental plans are also available from the firm at P.O. Box 33686, 55101.

and assigns line numbers to the stored text output.

Various management facilities are provided. The user has the option, for example, of printing on-line a full upper- and lower-case edit list for subsequent proofreading.

The system provides for segmentation of a job, under program control, into batches accessible by only a single terminal. It can also accumulate various

totals such as characters read, records read and lines printed, the vendor said.

Finally, Tesy creates an Isam-type file of the text material, accessible via the CRT devices.

To use the system, the operator must key in an acceptable identification number, but Tesy is designed to allow several retries if the first number keyed was erroneous. Once "approved," the operator keys in

batch number and project to be edited.

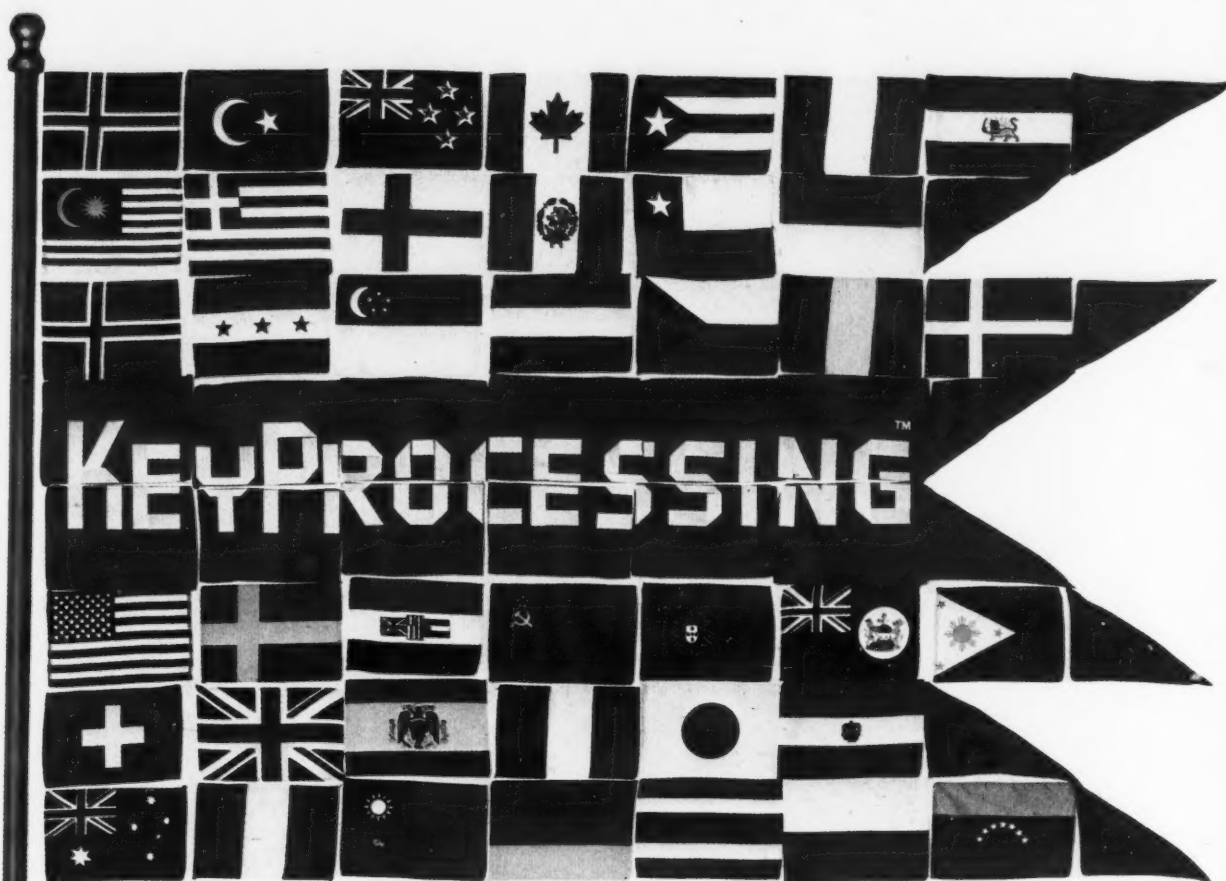
The operator is allowed to work through an entire text data file page by page with a terminal control key. Once the page to be changed is located, a blinking cursor can be moved to the point where the correction is to be made.

Editing commands allow character insertion, replacement or deletion as well as line insertion

and deletion. Maintenance of the same line numbers throughout the life of a file enable users to audit the changes made over time, the vendor noted.

If insertions cause a new line to be created, it is given a number between the two on either side of it.

A typical Tesy system costs under \$80,000. Delivery is three to four months from the firm at 140 Weldon Parkway, 63043.



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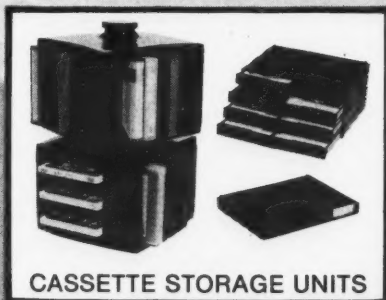


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The S-Series Cassette is made of high strength polystyrene. The corner rollers are molded and the slip sheets are pressed flat. Precision tape guides, perpendicular corner posts, and a spring foam pressure pad are featured. The same unbreakable polypropylene storage case is used to house the cassette. The S-Series achieves a high performance rating at a somewhat lower cost.



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In-House System Cuts Firm's T/S Costs Almost 75%

LOS ANGELES — When Union Oil Co. examined its outside time-sharing costs, it decided it had an opportunity to cut costs.

The analysis was right. An in-house system, installed the next year, cut per-hour time-sharing costs in half.

Now, three years later, per-hour costs are down an additional 25%. These savings are partially offset by increased communications costs, however.

Union Oil's computer services personnel estimate about three-quarters of the system's connect hours are used by far-flung departments and divisions to handle a range of economic, technical and scientific tasks.

The remaining time-sharing connect hours go to application program development and, to a small extent, improving the system's operation.

Union Oil users, anywhere from Texas to Alaska, can use computer terminals in their offices to get the answers they need from the system in the company's headquarters here. A combination of leased and dial-up telephone lines link the remote terminals to Los Angeles.

Union Oil's computer installation centers around an IBM System 370/168. It operates with IBM's Time Sharing Option (TSO) to interconnect the nearly 100 terminals used in remote locations, as well as those used by corporate headquarter departments.

Outside T/S Limiting

When time-sharing services were purchased from outside vendors, the answers an engineer or scientist could obtain were limited by the amount of company data on file with the particular service bureau with which he was linked. Now the in-house system enables users to reach necessary and relevant corporate information and data resources.

The exploration and producing groups were among the first in Union Oil to employ time-sharing services. Beginning about eight years ago, time-sharing was used to evaluate the economic potential of possible wildcat wells, extensions of existing oil fields, secondary recovery projects and other exploration and producing investment opportunities.

At first there were five terminals, located in the offices of the oil and gas operations and linked to a number of service bureaus. The memory capacity of the computers available through service bureaus was limited at that time.

The company, therefore, started out with a "slimmed down, minor version of the kind of economic evaluation program we really wanted," according to Charles H. Clark, manager of technical services in the Oil and Gas Division.

"We worked with the system for quite a while," Clark recalled, "and finally managed to achieve more in terms of economic evaluation than we had with batch processing. Eventually, our use of time-sharing proved so valuable that 30 terminals were put in field offices."

However, escalating costs, the lack of capacity to do the entire job and the inconvenience of having to maintain duplicate programs and libraries finally led to the installation of an in-house system.

Significant Contributions

Another use of the system became apparent in 1973 and 1974 when Union Oil, like other oil companies, received requests for

information, as well as new regulations and decisions issued by the Federal Energy Administration.

"Time-sharing enabled us to respond quickly," said Thomas M. Ragland, manager of systems and programming for the Oil and Gas Division.

Time-sharing's contribution before 1973 was also significant, Ragland said. "It helped increase computer programmers' pro-

ductivity by about 200%.

One program was developed in six months, instead of the estimated 18 months it would have taken without time-sharing, he said.

"We were able also to develop rapidly a new application for billing our joint-venture partners, who share the costs of operations with us," Ragland added.

"Now bills go out on the day a

billing period closes and payments return sooner. With the recent high interest rates, the pay-off on this project was excellent," he said.

Ragland calculated the cost of programmers at about four times the cost of machines in any systems development work. "As a result, anything we can do to make them more effective — such as using time-sharing — is

(Continued on Page 40)



On a magical afternoon in August, a cheer went up at Vadic. Why the celebration? We shipped our 100,000th modem. It went to Addressograph-Multigraph.

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SECURITY PACIFIC OPTIMATION SERVICES

Cost of T/S Drops Almost 75% After Company Buys Own System

(Continued from Page 39)

well worth the expense."

Charles R. Gahr, manager of computer services, pointed out that the total connect time billed to users has increased from 1,000 hours when the in-house system was first installed to over 4,000 hours per month.

Gahr expects time-sharing usage to increase 25% — to about 5,000 hours per month — this year, and eventually to about 8,000 hours. Meanwhile, hourly rates to users are expected to drop somewhat in the future.

Much of the growth will come in the distribution area, Gahr predicted.

"Our exploration and producing groups have gone a long way in using computers for economic analysis. Our refining and manufacturing have also done much. And

we have extensive experience in our refineries in using computers to solve problems.

Connect Time Billings Up

"But in distribution," Gahr noted, "we are learning constantly how to improve our operations through computer-based economic analysis. As the distribution and marketing picture changes — and as problems get more and more complex — I anticipate a sharp increase in time-sharing utilization by distribution planners and marketing personnel."

Union Oil's corporate planning unit is already an important time-sharing user. Warren H. Buell, manager of corporate planning services, told why.

"When the corporate plan and budget is presented to the executive committee, there are inevitably a great many questions about how the plan would be affected by changes in taxes, in prices and a wide variety of other factors," he said.

Answers Ready

"Often, we have anticipated the questions and have the answers ready. As for the few unexpected questions, time-sharing enables us to furnish the executive committee with answers in a matter of minutes — instead of hours or even days.

"In a complicated business like oil," Buell added, "where millions of dollars can depend on a single assumption — and decision making is exceedingly complex — that's a very helpful service to provide the decision makers."

Series 300 Extends Forms-Handling Line Of Standard Register

DAYTON, Ohio — The Series 300 slitter/merger/imprinter (SMI) is the latest addition to the auxiliary continuous forms-handling equipment line of The Standard Register Co.

Depending on the optional features included, the Series 300 SMI may be converted from its free-standing base unit, having a positive pinbelt forms-feeding control, into any one of seven different machines.

These include use as a simple margin slitter (Model 302) or as an imprinter of one-wide (Model 303) or two-wide forms (Model 305).

Works in Tandem

For use in tandem with a forms-bursting device, the unit is equipped with a Photocell Loop Control allowing synchronized operation of both devices at speeds up to 300 ft/min.

The SMI device handles paper weights from 12- to 125 lbs at speeds varying from 80- to 300 ft/min, depending on the forms and function involved.

Prices range from \$1,250 to \$1,895 or \$48- to \$75/mo on a lease arrangement from the firm here in Dayton, 45401.

Device Protects DP Shops With Water-Cooled CPUs

ROCKVILLE, Md. — DP shops that use chilled water under raised floors to help cool their DP equipment may be interested in the Denco Model WD 2-10 water detection system.

The device's "continuous-element sensor" is said to be capable of detecting even minute quantities of water anywhere along its entire length. The unit costs \$1,995 from the firm at P.O. Box 1442, 20850.

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The EDP Seminar Series gives you practical applications of the newest advances in computer management. What you learn will save you time and money, because each course is geared to practical dollars and sense application.

Remember, these are seminars, not lectures, and you'll be learning by doing in a shirtsleeve atmosphere. Workshops are an important feature of the Seminars, and round table discussions and shop talk luncheons complement the seminar presentations. The workbooks and course materials are yours to keep, so you'll always have a handy reference to all you've learned.

We've selected leading experts from around the country to guide each of our Seminars. They are highly accomplished specialists in their fields, experienced in presenting their techniques to industry and management. If you're involved in one of the areas shown, you should attend the EDP Seminar Series this fall. What you learn will benefit your company, your installation, and you.

Data Communications Course #1010 — Practical Data Communications Systems & Concepts

Dr. Dixon Doll, the nationally recognized teleprocessing consultant will lead this two-day seminar on the newest advances in data communications. The course covers areas like SDLC, HiD-LoD, DDS, newly approved major revisions to WATS, and the impact of Satellite Carriers.

Total Cost, including workbook, reference materials luncheons and continental breakfasts is \$350. Additional registrants from the same company qualify for the reduced rate of \$300.

San Diego	Plaza Int'l Hotel	Sept. 29-30
New York	St. Moritz	Oct. 13-14
San Francisco	Dunfey's	
	Royal Coach	Oct. 20-21
Dallas	Hilton Inn	Nov. 10-11
Miami	Marriott	
	Miami Beach	Nov. 17-18

Data Communications Course #1020 — Advanced Teleprocessing Systems & Design

Also led by Dr. Dixon Doll, this course is a follow-up to course #1010. Special emphasis is given to techniques that minimize operating costs in commercial data communications networks. This three-day seminar covers procedures, approaches, and algorithms for evaluating and cost-optimizing network operations. Total cost, including an extensive set of customized course materials, is \$450. Additional registrants from the same company qualify for a reduced rate of \$400.

Miami	Holiday Inn	
	Airport Lakes	Dec. 1-3

Legal Tools for Computer Contracting and Protection

Under the instruction of Roy N. Freed, a nationally known lawyer, author and educator in the field of computer law, you'll learn how to increase your advantage in dealing with vendors that supply your installation. As well as practical discussion and review of your own contracts, subject areas covered in this 2½-day seminar include: Negotiations, Contracts, Warranties, Avoidance and resolution of disputes, Security, Fraud, Taxation, and Techniques for handling any transaction. Cost for the entire seminar, including continental breakfasts, luncheons and all course materials is \$325. Additional registrants from the same company are charged only \$275.

New York	Summit Hotel	Oct. 22-24
San Francisco	Hyatt Regency	
	San Francisco	Nov. 12-14
Chicago	Hyatt Regency	
	O'Hare	Nov. 19-21

How to Draft Effective Legal Agreements

This one-day seminar is a complete workshop for non-legal, technical people who may be called upon to draft legal agreements for their company. Also led by Roy Freed, this seminar covers a variety of formal agreements, their structure and the legal factors involved. You'll have all the basic skills necessary to write legal agreements, and you'll be able to spot items that really require the attention of lawyers. Cost for the seminar, including luncheon and a complete workbook on the subject, is \$135.

New York	St. Moritz	Oct. 8
Boston	Sheraton	Oct. 15

Data Base Design

Given in association with Leo J. Cohen and Performance Development Corporation, this three-day seminar is a package-independent examination of the techniques required for the design of effective data base systems. The seminar covers Effective Record Design, Physical Storage Techniques, Optimum File Organization/Indexing Techniques, File Integration, and much more.

Cost for the seminar, including course materials, continental breakfasts and luncheons is \$350. Additional registrants from the same company qualify for a reduced rate of \$300.

New York	St. Moritz	Sept. 22-24
Denver	Denver Hilton	Dec. 1-3

Performance Evaluation and Improvement

Saul Stimler, author of *Data Processing Systems: Their performance, evaluation, measurement, and improvement* will lead this two-day seminar on measurement techniques designed to save your installation money. As well as system performance at your own installation, topics covered include: Criteria for quantifying performance, pencil and paper analysis of a system, Benchmarking techniques, Realtime, Batch and interactive time sharing systems.

Cost for the seminar, including continental breakfasts and luncheons and all course materials is \$250.

New York	Summit Hotel	Sept. 29-30
Wash., D.C.	Marriott	
	at Wash. Int'l.	
	Airport	Oct. 20-21
Chicago	Hyatt Regency	
	O'Hare	Oct. 27-28
San Francisco	Dunfey's	
	Royal Coach	Jan. 19-20

How to Increase Programming Productivity

John W. Brackett, PhD, Vice President of SofTech, Inc., will lead this two-day seminar for technical managers on the state of the art of Software Engineering. Under his direction you will learn how to: create more precise and visible analysis and design; reduce integration problems; improve software reliability; incorporate visible outputs into the software development cycle; increase programmer productivity; and improve programming management methods. Topics covered include: Structured programming; Top-down analysis, design, implementation; and Chief Programmer teams. Cost for the entire seminar, including continental breakfasts, luncheons, and all course materials is \$300. Additional registrants from the same company are charged only \$250.

New York	St. Moritz	Oct. 6-7
San Francisco	Berkeley	
	Marriott	Nov. 10-11



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As Result of Privacy Act

Exotic Security Devices Sure to Be Part of DP Future

By Ralf Brent

Special to Computerworld

NEW YORK — A new set of government regulations and guidelines is due to go into effect at the end of this month that will materially change the security environment in which computers will be operated.

The implications of the Privacy Act of 1974 particularly apply to systems containing sensitive personal data and proprietary information which might be deemed secret or confidential.

As with most legislation, there are unforeseen results which have cropped up, resulting in a whole new set of restrictions and problems with which most computer people have not had to deal until now.

If these restrictions and measures to comply with them are not already the talk of the industry, they soon will be, as manufacturers, distributors and installers of various security devices of a quite exotic nature begin to aggressively sell their wares.

NBS Efforts

The systems and software section of the National Bureau of Standards (NBS) has already published a set of guidelines and is offering lists of workshops and seminars.

It has also recommended that four papers published by the Computer and Business Equipment Manufacturers Association (Cbema) be placed on the reading list of computer executives and security directors.

In those industries with sensitive government contracts, the government apparently intends to prescribe just how rigid security must be. And it seems that before too long, certain types of devices will be finding their way into the government handbooks for computer security.

According to NBS publications, there are about 130,000 computers in place in the country representing a physical asset value of almost \$30 billion. "There is no way to place a value on the millions of data files and programs used by these machines or on the value of the services performed by these machines. Companies have nearly been put out of business by manipulation of their data files," these pamphlets stated.

"Computer-services usually operate as far as possible according to guidelines and instruction provided by their customers; special care such as the use of a dedicated computer may be provided for users if requested and paid for," these reports said.

And then comes the portent for the future as far as government intervention in security procedures are concerned: "Eventually the requirement for computer security may create specialized computer facilities which are certified to be secure for specified purposes."

"Certified" and "specified" are not imprecise terms, but words which definitely imply that, at some point, the prospect of gov-

ernment standards and prescribed solutions to computer security will become the order of the day.

The new techniques which seem called for in the government's new computer security guidelines have now gone far beyond locks and keys, dial combinations and guards.

Photo badges, even with electronically coded information about the bearer, seem already

too simplistic. Embossed and punched identification cards, which can all too easily be lost, borrowed, stolen or duplicated, also will no longer fill the bill, at least not without additional verification that the person carrying the card is actually the one to whom it was originally issued.

All indications, as uncovered in a study by John Moynahan & Co., point to a combination of key cards and encoded biometric

data or computer-stored memory concerning the individual.

Those who in the future will be permitted to enter a particular data center and use certain portions of data files will carry special cards designed to be slipped into sophisticated "readers" installed on walls, doors or actually attached to the computer consoles.

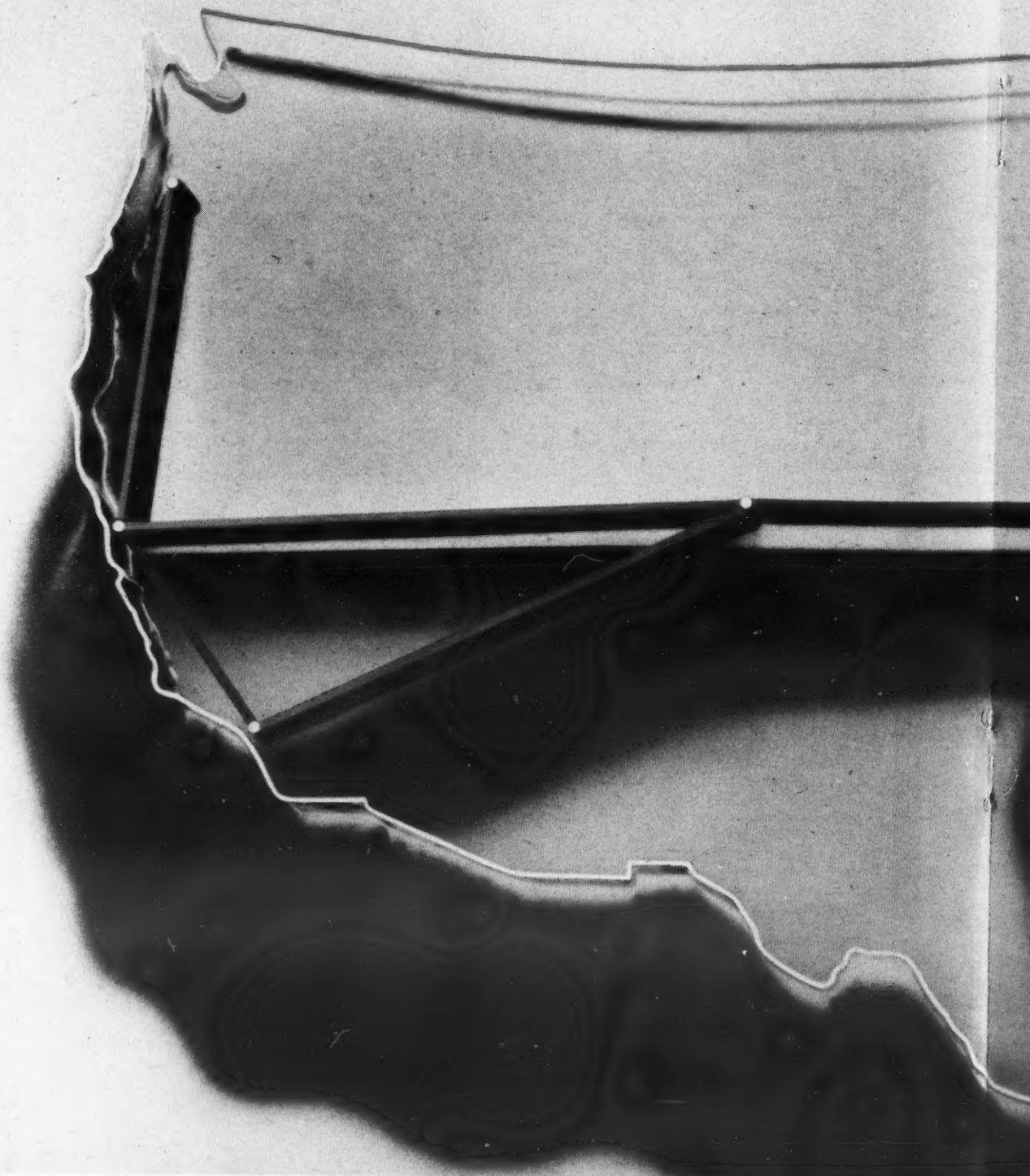
The biometric measurements at
(Continued on Page 43)

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Key-to-Disk Reduces Moving Company's Staff, Shifts

GLENDALE, Calif. — Replacing keypunches with key-to-disk had a marked effect on Bekins Moving and Storage Co.: The data entry department was able to cut its staff by a third and go from three shifts to two.

Bekins performed a feasibility study on staying with keypunches vs. going to key-to-disk, Boris Popin, operations manager, recalled. The study looked at the current costs of cards and people and the amount of work a person can do at a keypunch or keystation, he said.

The DP shop's responsibilities were growing rapidly and the volume of punch cards was already "just astronomical," Popin said. "On just one financial system, we were creating 100,000 card records a month."

The study found key-to-disk better able to cope with further growth, he said.

Bekins bought an Entrex System 480 with 10 keystations because of the "software, the disk, the keyboards and the price," Popin said.

Once prepared, the data runs

on a Burroughs B3700 CPU.

Since the key-to-disk system was installed in February, Bekins has reduced its data preparation staff from 27 to 18, all through attrition, Popin noted. The firm also dropped its third shift.

Additionally, the firm had spent an average of \$2,065/mo on outside keypunch services between January 1974 and August 1974. Since that August, the company has had no keypunch work done outside its own shop.

Key-to-disk itself gives the user about a 20% productivity gain

because it avoids "the manual slowdown" of handling cards and offers formatting of data, validation and other useful features, Popin explained.

Popin was unworried about what might happen if the key-to-disk controller went down. "We have about four other users in the area, plus Entrex, that we

could go to in case the system controller failed," he said.

The company has copies of its key-to-disk software ready for such an emergency, he added.

Popin said he has not experienced any downtime on the \$67,000 system other than two hours of preventive maintenance a month.

Exotic Security Devices in Future

(Continued from Page 42)
present fall into several categories: hand geometry, fingerprints,

voice prints and signature impressions. The "Computer Security Guidelines for Implementing The Privacy Act of 1974," prepared by the NBS, stated: "There are three categories of methods by which a person's identity may be established for the purpose of allowing access to an information system."

"The methods, which can be applied singly or in combination, are based on: (1) Something the person knows (a code word or number), (2) Something the person has (a key card or key) (3) something the person is."

This third category, the guidelines said consists of characteristics, such as a person's appearance, fingerprints, hand geometry, voice or signature."

Referring to unique physical keys, the pamphlet said: "Such physical items, however, are easily lost, stolen or counterfeited."

Again quoting the "Executive Guide" on biometric data: "These biometric methods promise high reliability and accuracy, but most techniques are still in the research stage."

However, the Identimat Co. has installed its hand-geometry machines in over 100 locations. Another biometric device, Fingerscan, utilizes fingerprints, which are compared against coded information previously recorded.

Other biometric measurement devices include "voice print" techniques which compare the human characteristics of a person's speech which are unique. The device must interface with a certain dedicated section of the computer's storage capacity.

Veripen's signature-based system utilizes an electronic ball-point pen hooked to a computer. The processor compares pressure of the pen and time taken for the formation of each letter of a person's signature with previously recorded data.

The Federal Reserve System is reported to be testing some of these devices; no findings have yet been made, however, and no recommendations have been forthcoming.

Brent is senior vice-president at John Moynahan & Co., New York City.

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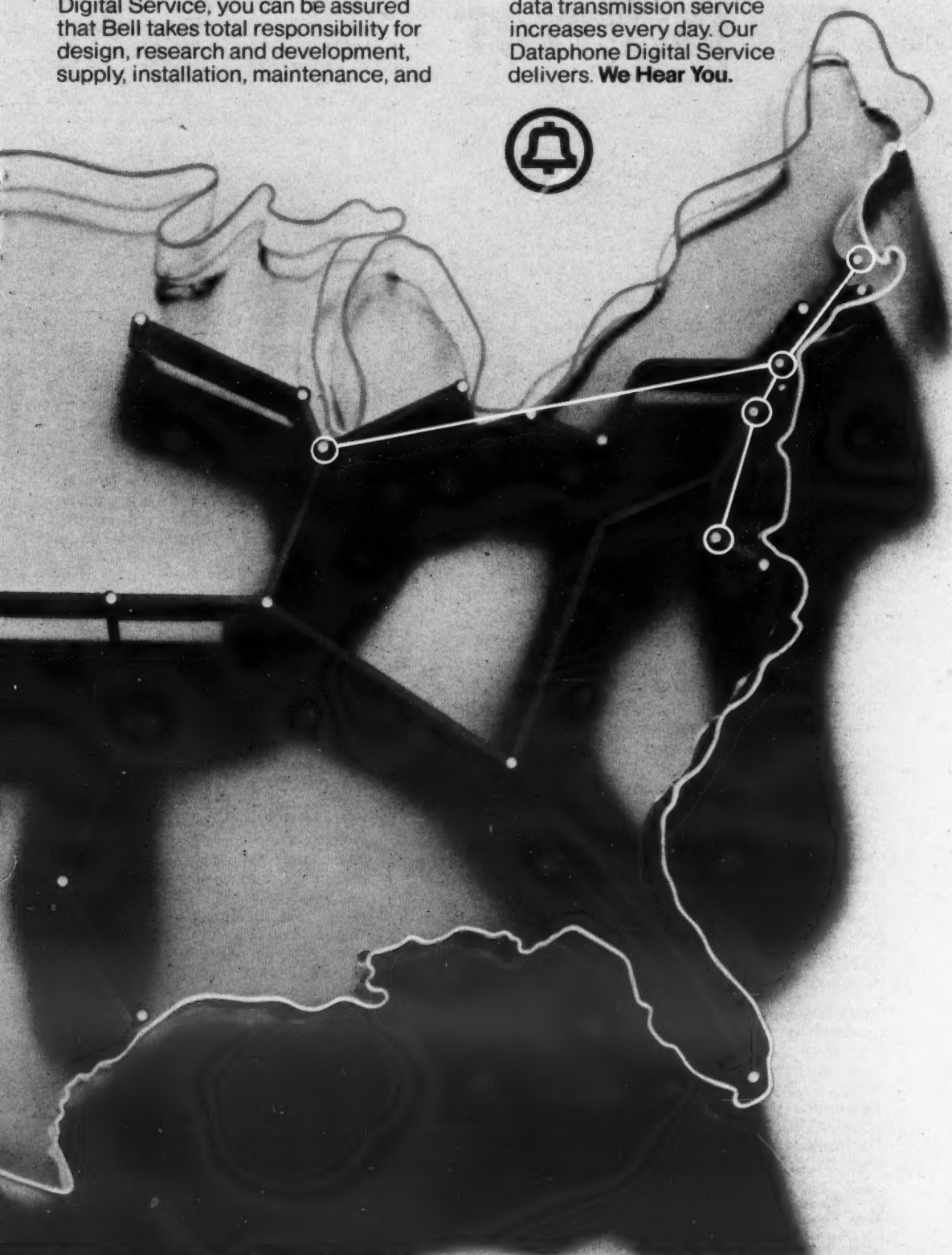
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Traffic Court System Triples City's Parking Ticket Revenues

PITTSBURGH, Pa. — Pittsburgh's conversion to a central, large-scale DP facility has had a notable effect on the city's Traffic Court — revenue collections tripled in four years, even though the number of tickets issued rose only 50%.

Back in 1968, Traffic Court operated with a manual card file. Copies of the parking tickets were filed by number. When a ticket was paid, the copy was pulled.

When a copy was missing from the file, it was assumed the ticket was paid. There was no particular system for tracking down scofflaws.

Then, in 1969, a new administration with a heavy commitment to DP took office. A staff was assembled under the Office of the Mayor and, the following year, an NCR Century 200 computer was

installed to take on jobs from all departments.

Before long, the workload became overwhelming and, by the end of the year, a second Century 200 was added.

For economic reasons, the two Century 200s were replaced in July 1973 by a Century 300 with 256K words of memory, six dual disk units, four magnetic tape drives, two printers and seven CRT terminals.

With this system, Traffic Court has been able to capture the details of every parking ticket on the magnetic disk file. At any one time, there are about 50,000 parking tickets outstanding.

After the tickets are written, copies are brought to Traffic Court, where they are batched and keypunched for entry onto the computer file. The stored data includes ticket number, automobile license number, vehicle make, type of violation, time and location.

The computer's unpaid ticket file is on-line to four CRT terminals, three in Traffic Court and one in the Police Communications Center. When a ticket is paid, the number and fine amount are keypunched for entry into the computer that night to erase the item from the file. The unpaid ticket file is therefore current to the previous day's transactions.

For all tickets not paid in a week, the computer automatically prepares a magnetic tape containing each vehicle's license number. The tape is sent to the state motor vehicle bureau, where the owners' names and addresses are picked up from the state's computer files.

The tape is returned to Pittsburgh where the names and addresses are read into the Century 300 and added to the unpaid ticket file.

System Prints Summonses

Using this name and address information, the computer prints summonses that are mailed to the vehicle owners. Every time a summons is issued, court costs are added to the fine and these are both printed on the notice and posted to the unpaid ticket file.

If a summons is not returned in 10 days, the computer prints a warrant, again adding court costs to it and the on-line file. The warrant is sent to the violator and a constable.

In most cases, the arrest warrants bring almost immediate results. When fines are paid in Traffic Court, the clerks enter the ticket and license numbers through the CRT terminals. The computer searches the file and displays the data on the unpaid ticket.

In a cross-check, the computer also scans the file for the vehicle license numbers and, when there are other unpaid tickets charged to those cars, it will respond: "There are additional tickets."

To find out what these additional tickets are, the clerks make another inquiry through the terminals.

It is almost impossible for a violator to pay one fine and not be nailed for other outstanding tickets. It is possible for a violator not to answer a summons or a warrant, but if he is an habitual offender — 25 or more tickets — and has not paid his fines, the computer adds his vehicle's license number to an updated list for distribution to the police.

Then, if the car is spotted on the street, it is towed away and can be recovered only after the fines and costs have been paid. The warrant for a single violation also gives the police authority to tow away the vehicle.

With access to the same computer information, the terminal in the Police Communications Center is used to answer inquiries radioed in from patrol cars and meter maids who have spotted what they think are scofflaw vehicles.

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Our new 80-column Model 306C prints 80...96...and 132 columns per line — by simply flicking a switch or by software command.

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Transaction Processing:

Honeywell's Transaction Driven System can give you a big jump on your competition.



It can make your people more productive — give you more control over your business.

Transaction processing — putting people in touch with up-to-the-minute data so they can do their jobs more quickly, accurately, and efficiently. This spontaneous style of information processing puts the power of a central computer into the mainstream of business activity. Information inquiries and entries are made through an onsite terminal. Then, rapid transmission over communication lines gets the information where it's needed, when it's needed — for decision making, cost control, better customer service.

Transaction processing is one of the many computing dimensions available

with Honeywell's Series 60 Level 66 systems. These are systems made to meet your present and future requirements. The modular design of Level 66 hardware allows tailored growth from your first large-scale system all the way to a superpower computer. Start with the Level 66 system that meets your current price-performance needs. Then add hardware as you need it, and upgrade without reprogramming. All Level 66 systems use one version of Honeywell's General Comprehensive Operating Supervisor (GCOS). All user software and data files are compatible on all Level 66 systems.

TDS—our newest interactive software

Honeywell's newest software for interactive processing is the Transaction Driven System (TDS). Operating within the GCOS operating software, TDS offers advantages in processing and implementation:

Timeliness—Information is current. Each transaction triggers immediate updating of the online data base.

Responsiveness—Transactions are processed as they occur, in direct response to the sender's inquiry or instructions.

Protection—Stored data is guarded against erroneous updating, or loss, through Honeywell's data base management system, Integrated Data Store.

Flexibility—TDS can run concurrently with local batch processing, remote job entry, and time sharing. The user provides the variables to tailor the system, and TDS supplies a COBOL-like language to simplify the programming.

Speed—Separate management of the network and the central system expedites processing. Honeywell's Network Processing Supervisor and DATANET Front-End Network Processor handle all communications between terminals and the central system. GCOS and the Level 66 central system handle the information processing.

Simplicity—It's quick and easy for anyone familiar with a keyboard or terminal to learn how to retrieve and update information with TDS.

Economy—Design and implementation costs are reduced by easy-to-use interfaces for the whole system—operating system software, data base management, and terminals.

How TDS is used

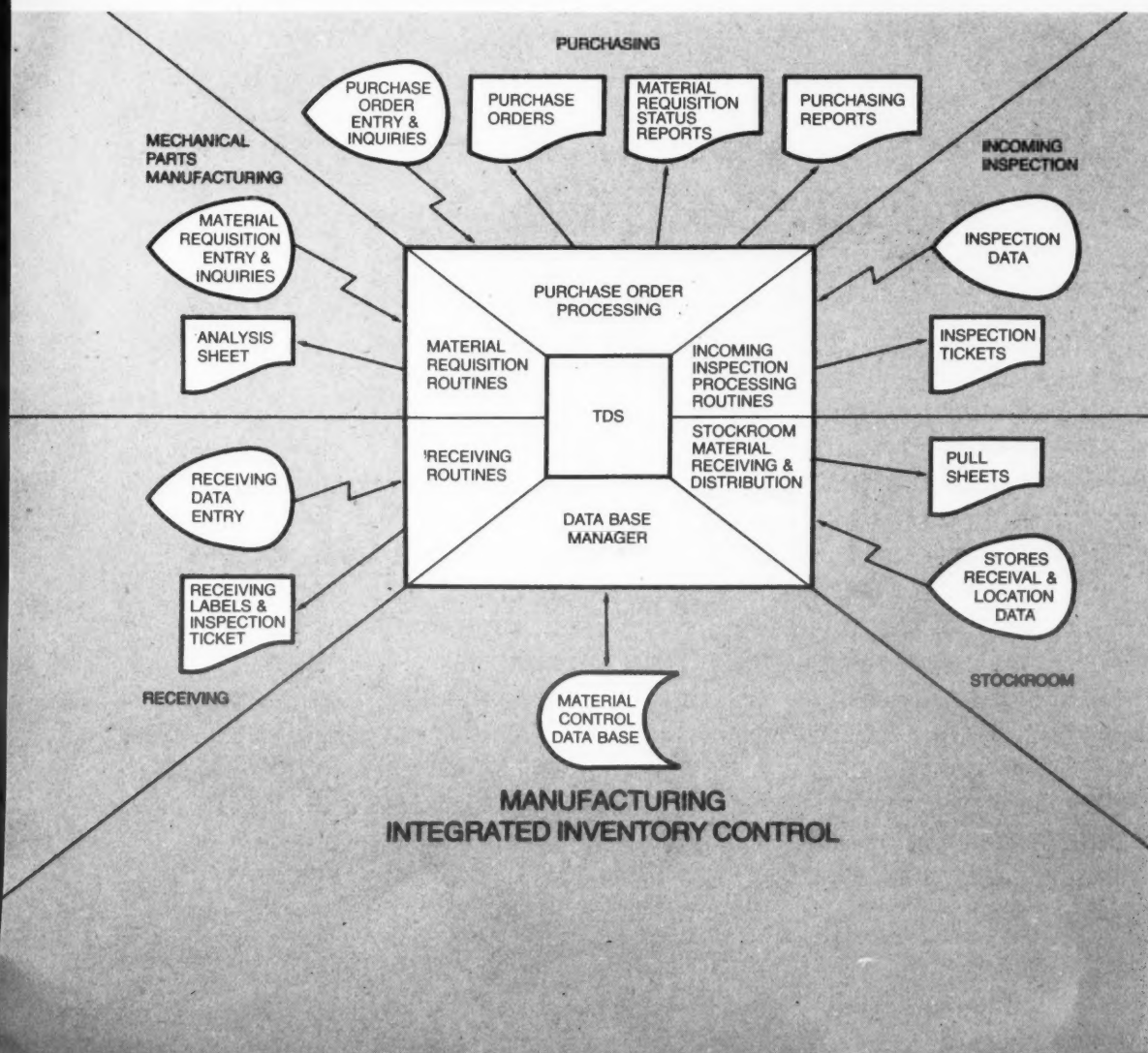
When your business requires quick response—in order processing, inventory control, or manage-



ment-oriented inquiries—TDS is an efficient tool to meet that requirement.

Insurance companies, hospitals, brokerage firms and airlines are typical industries that need to maintain the high quality of customer service and operational efficiency that TDS can provide.

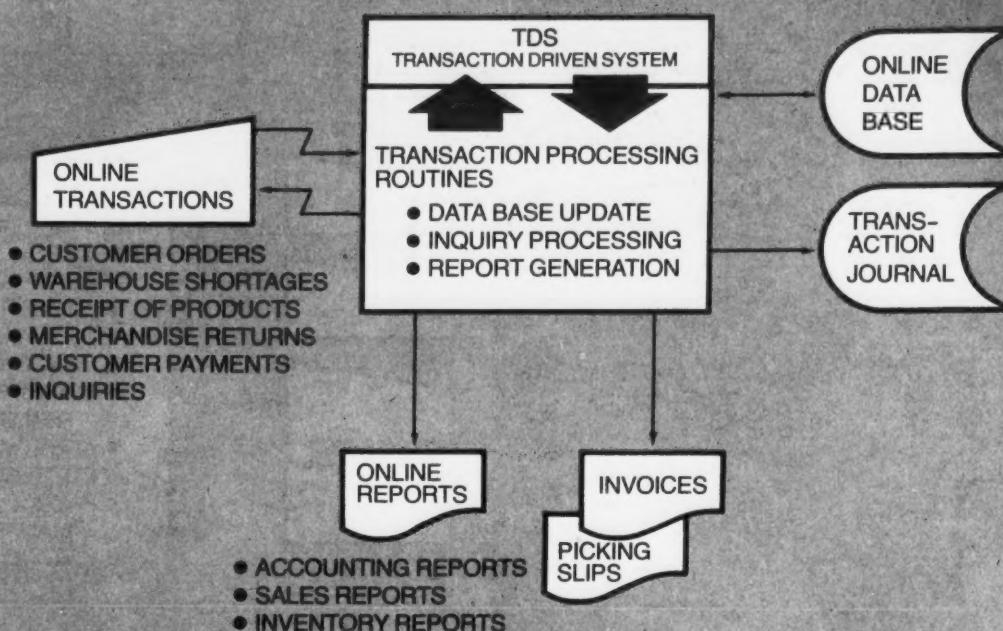
Manufacturers and distributors use TDS to improve inventory management and online order entry. Banks use TDS to speed teller operations and tie their remote locations into the central computer.



...In Manufacturing

A high-technology electronics equipment manufacturer uses TDS to organize and control manufacturing inventories. By integrating and managing critical functions in the inventory cycle, such as controlling backorders, issuing work authorizations, and generating internal purchase orders, TDS helps minimize the problems surrounding the flow of materials.

At work stations throughout the company — purchasing, incoming inspection, receiving — employees enter data at visual display terminals. All input data is edited as it is entered. Errors can be detected and corrected immediately by the originator. Once information has been entered into the data base, it is immediately accessible to all the work stations. As a result, backorders can be monitored more closely, work authorizations are easy to trace, and purchase orders can be printed automatically.



PHARMACEUTICAL DISTRIBUTION
ONLINE ORDER PROCESSING

...In Distribution

A large regional drug distributor uses TDS for online order entry and accounts receivable. Visual display terminals at key points in the distribution cycle gather the information at its source.

Input begins with customer orders, written or by telephone. Operators enter the orders on terminal keyboards. TDS automatically verifies and checks product item and quantity-on-hand. Discounts, due dates, and bonuses are established, and the customer is advised of any promotional offerings.

TDS follows up through the order processing activities, immediately updating online the product and customer files, automatically preparing backorders, purchase orders, and shelf-replenishment orders, and accumulating order data for analysis.



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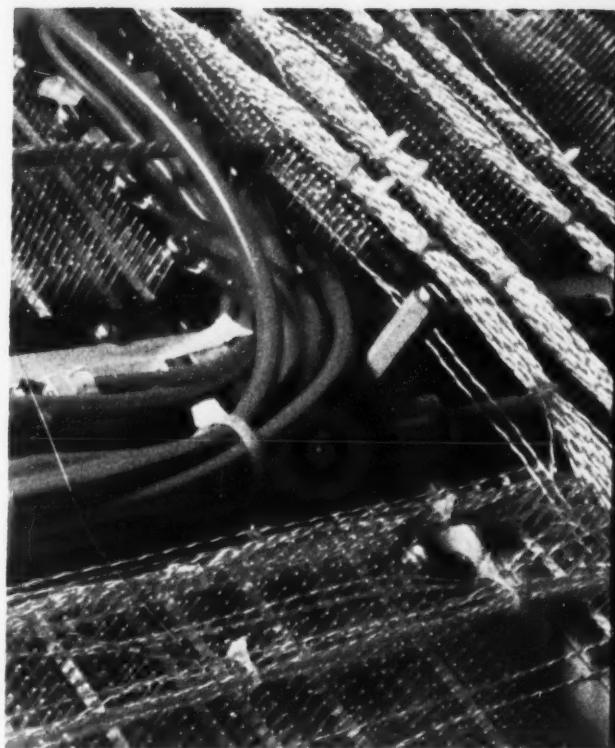
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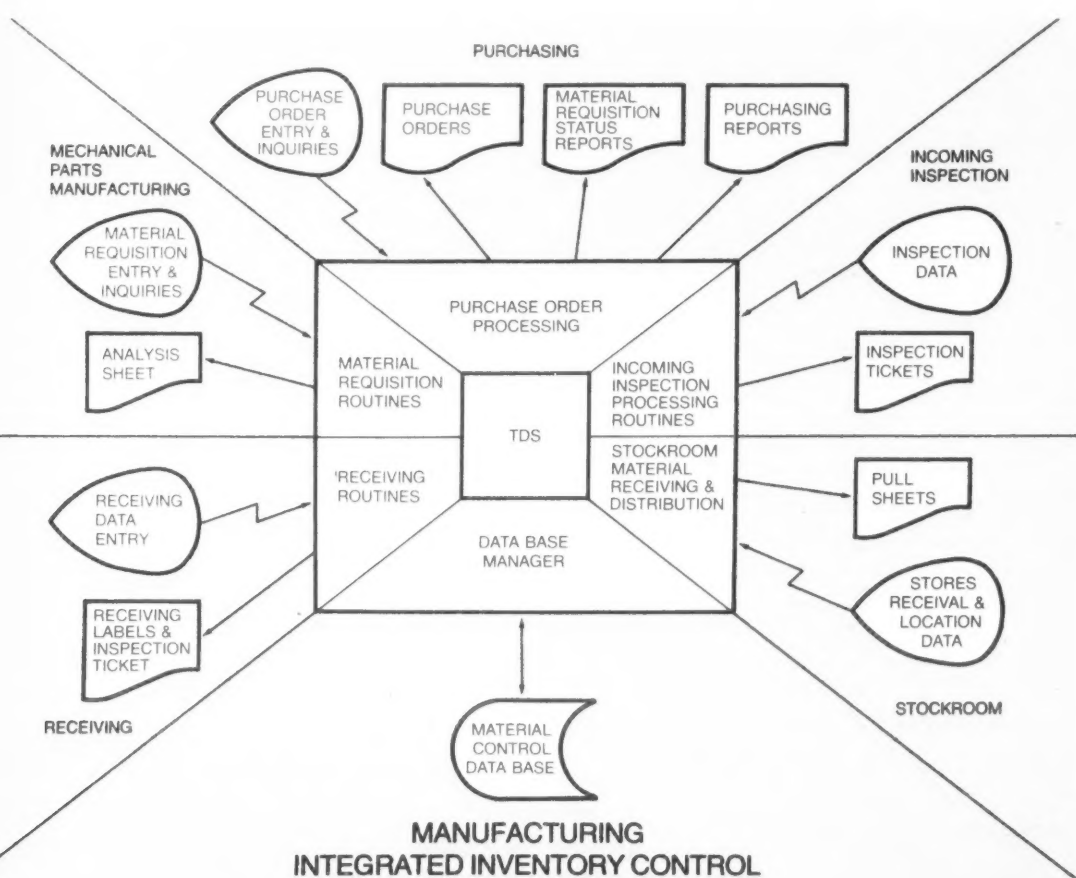
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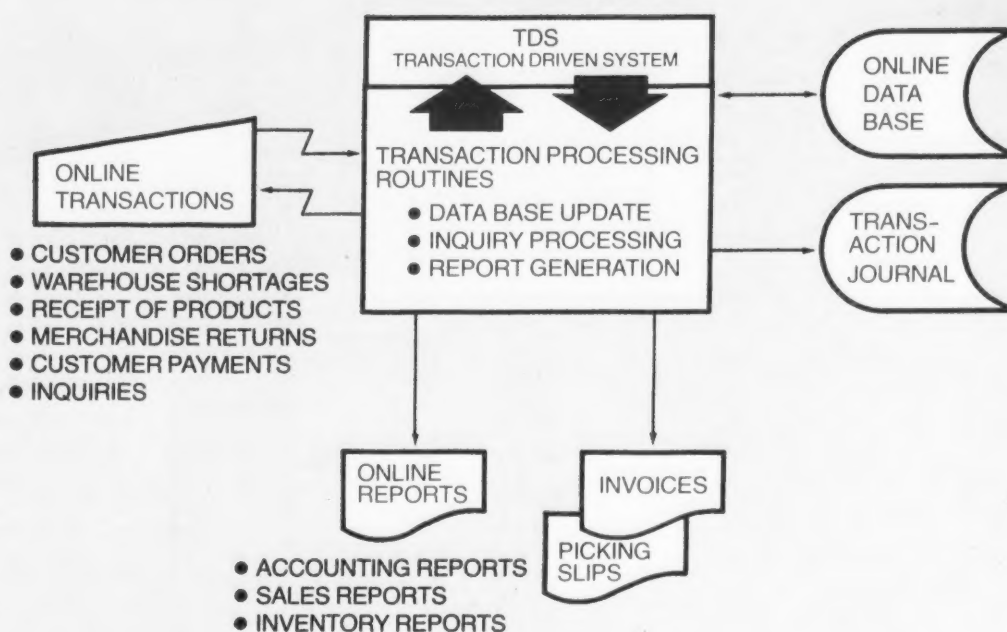
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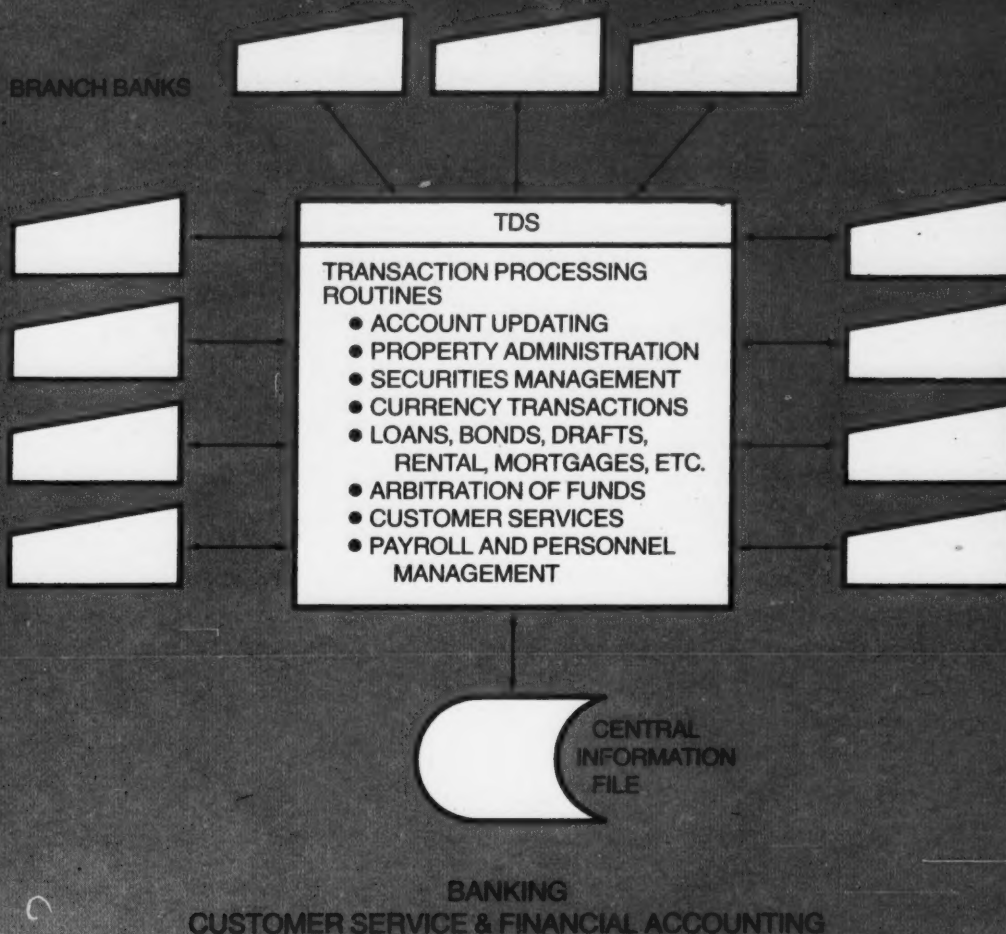
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...In Banking

A major commercial bank uses TDS for account updating and currency and bond transactions, as well as for loan and mortgage accounting. TDS speeds file inquiries and such complex calculations as securities evaluations, financial ratio analysis, and amortizations. The system links an online central computer to a network serving nearly 200 terminals, 1100 employees, and 33 branch offices.

TDS helps the bank keep its document production, circulation, and inquiries to a minimum, giving employees more time to do their jobs. And since the network shares a common data base, all personnel can obtain necessary information quickly and economically.

Transaction processing plays an important role at the teller windows. TDS enables tellers to record customer account transactions easily and update the data base. The teller or operator simply types in a message to begin processing a transaction. Service operations — check approvals, holds, or stop payments — are also handled by TDS. In a typical check transaction, the check is accepted or rejected immediately on the basis of the account status.

TDS and Level 66 Can Help You Improve Your Business, Too.

Get more for your investment. Let Honeywell's TDS and multi-

dimensional computer power improve information management and apply new and advanced techniques. Level 66 systems have all the general purpose capabilities of any large system, *plus* local batch, remote job entry, time sharing, and transaction processing.

Level 66 systems with TDS make online transaction processing practical for a wide variety of industries and applications. Flexibility, very high performance, fast recovery and restart capabilities, efficient terminal and data base management, and easy-to-use concepts make TDS one of the most advanced systems for transaction processing in the industry today.

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I'm interested in Transaction Processing. Tell me more.

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Mini Bits

Tape Drive for DG Nova Requires No Formatter

BOULDER, Colo. — The Model 103D interface system provides 1/2-in. industry-compatible tape storage for Data General Nova computers at a price comparable with cassette and paper tape systems, according to its developer, Rela Designs, Inc.

The interface uses programmed I/O transfers rather than the data channel, resulting in fewer components than in commonly available interfaces. The interface occupies one card slot in the Nova.

No formatter is required since this function is performed by the software provided. Special connectors plug directly into the Nova backplane, making installation simple, the vendor said, adding it will provide complete programming support for the system.

The interface circuit board is priced at \$900 and tape drives (Perc 5000, 7000 and 8000s) range from \$2,400 to \$3,800. The MSOS operating system (including Basic driver) is \$700.

The firm is at 1322 Arapahoe, 80302.

BDSC Offers Business Mini

PALO ALTO, Calif. — Business Data Systems of California, Inc. (BDSC) has introduced the BDS 0/100 business minicomputer system which consists of a 16K-word CPU, 12M bytes of fixed disk, a 24 by 80 character CRT and a 100 line/min printer.

A variety of equipment options are offered, including application libraries designed to tailor the BDS 0/100 for individual end-user requirements.

All system components are enclosed and tested in a desk configuration.

The BDS 0/100 utilizes a disk operating system called BDSOS and features Ex-basic, an extended Basic that supports up to eight users.

The BDS 0/100 is available in 30 to 45 days and is priced at \$17,500 in quantities of 15. The firm is at 260 Sheridan Ave., Suite 100, 94306.

Pryor Pak Holds S/32 Supplies

CHICAGO — The Pryor Pak 32 from Pryor Corp. is a mixed group of supply items in one package for the IBM System/32 user.

Packaged in one United Parcel-shippable box, the Pak contains 30 diskettes, 1,500 stock forms, five binders and six printer ribbons. It sells for \$232.

The box can be reused for storage if desired, the firm said from 400 N. Michigan Ave., 60611.

Slated for Nov. 17-19

Major Conference Set on Applications

WASHINGTON, D.C. — A major conference on minicomputer applications in government, business and other organizations will be presented by the American Institute of Industrial Engineers (AIIE) here at the Sheraton Beltway Convention Center on Nov. 17-19.

Featured conference speakers include:

- Walter L. Anderson, associate director for the Automated DP Financial and General Management Studies Division of the U.S. General Accounting Office (GAO).

- Kenneth Harple, president of Modular Computer Systems.

- Kenneth Olsen, president of Digital Equipment Corp.

- Theodore D. Puckorius, commissioner of the General Services Administration's Automated Data and Telecommunications Service.

The conference is designed to promote effective minicomputer applications by attendees, the AIIE said. Successful minicomputer applications experience and "lessons learned" by users will be presented in overviews and case study workshops.

The new GAO study recommending expanded minicomputer usage in government agencies will be highlighted at the conference. Other plenary sessions presenting overviews of government and business minicomputer usage will focus on minis as extensions of centralized data processing, stand-alone, general-purpose systems, networks and dedicated systems.

Concurrent workshops are scheduled to present in-depth case studies of current successful minicomputer applications. Case presentations will be followed by

panel discussions involving additional user executives and conference attendees.

Scheduled workshops include:

- Stand-alone, general-purpose minicomputers.

- Minicomputers as extension of central data processing.

- Minicomputer networks.

- Intelligent terminals and minicomputers: data handling applications.

- Dedicated minicomputers: innovative applications.

On the final day of the conference, concurrent panel discussions are scheduled on minicomputer procurement, with one panel covering procurement by government agencies, another panel procurement by business and other institutions.

Procurement panel presentations and discussion will encompass check lists used before and after vendor selection. Special emphasis will be placed on effective follow-through with vendors after purchase.

The workshop on "Stand-Alone, General-Purpose Minicomputers" will cover minicomputers as an approach to decentralized data processing for the large user or as a total service for the smaller user. Applications software may be provided by central data processing, local programming or turnkey hardware/software acquisition.

The workshop on "Minicomputers as an Extension of Central Data Processing" will cover systems combining a large central computer with minicomputers or intelligent terminals having limited local processing capability.

The "Minicomputer Networks" workshop will cover systems involving distributed processing power without the use of

a large central computer — those based on minicomputers alone.

The "Intelligent Terminals and Minicomputers" workshop will focus on data handling applications, with standard or locally controlled programming, for transmission to central data bases. The "Dedicated Minicomputers" workshop will survey minicomputers in a one-application environment, including complete hardware/software systems designed for standardized multiple installations.

AIIE Seminars can be reached through P.O. Box 25116, Los Angeles, Calif. 90025.

Write Now

October is data entry month at *Computerworld*. And the Special Report in the Oct. 29 issue will cover the wide range of data entry with heavy emphasis on remote data capture.

The use of minicomputers is becoming a key part of the data entry function, and stories of successful installations will be a major feature of our special report.

You don't have to be a professional writer to tell of your installation or application in CW. Just send us a three- or four-page, typed, double-spaced note and explain what you had before, what you have now, why you changed, the advantages of the new system and just how effective the change was from a cost- or time-saving point of view. Our team of editors will take it from there. CW is at 797 Washington St., Newton, Mass. 02160.

Apodictics Links Line Printer to S/3 Model 16...

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RPG program output may be directed to either the standard IBM printer or the Fast Printer under program or operator control. Most system logging, utility program and RPG compiler outputs can also be directed to the Fast Printer when it is attached to a model 6 or 10.

Special custom software is available for unique printer applications on all models of the System/3, the company added.

The printer handles multipart forms and has 132 print positions and 64 characters. Additional features include full line buf-

fering and electronic forms control.

Options include special character sets, upper/lower case, boldface-accented characters and 48- or 96- character sets.

Prices range from \$8,300 for the 200 line/min, 64-character printer to \$14,900 depending upon options. Apodictics is at 321 S. Main St., P.O. Box 2109, 48106.

...And Paper Tape Unit, Too

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Utilizing the Remex 6375 reader/punch, the system provides the System/3 user with a read speed of 300 char./sec. and a punch speed of 75 char./sec using standard 8-channel tape or 6-track typesetter tape.

The system attaches directly to all models of the System/3 and no additional IBM hardware or software is required. Complete software support is provided

which allows the user to program the tape reader/punch as easily as the MFCU, the firm added.

Automatic Conversion

Automatic Ascii-to-Ebcdic conversion is done in the software and an option is included which allows the programmer to specify any code conversion table desired or read and punch straight Ebcdic.

The reader/punch system is priced at \$4,900. The 300 char./sec reader is available as a separate system for \$3,585, the firm said from 321 S. Main St., 48106.

the Computer Equipment Directory

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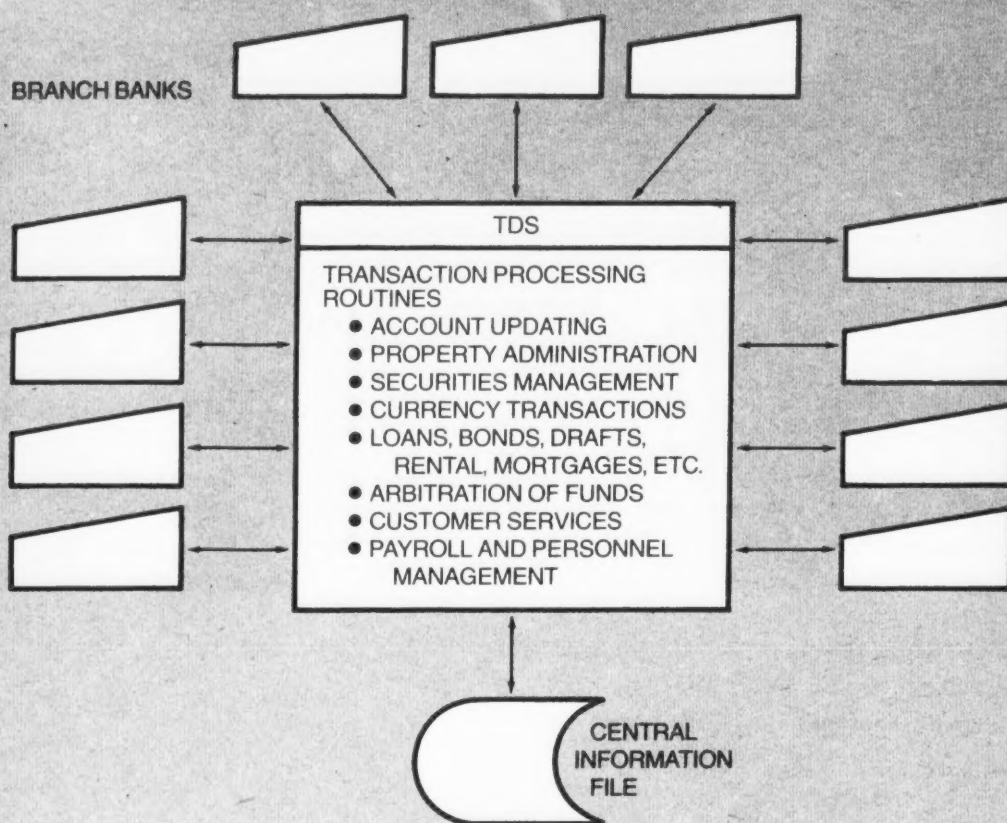
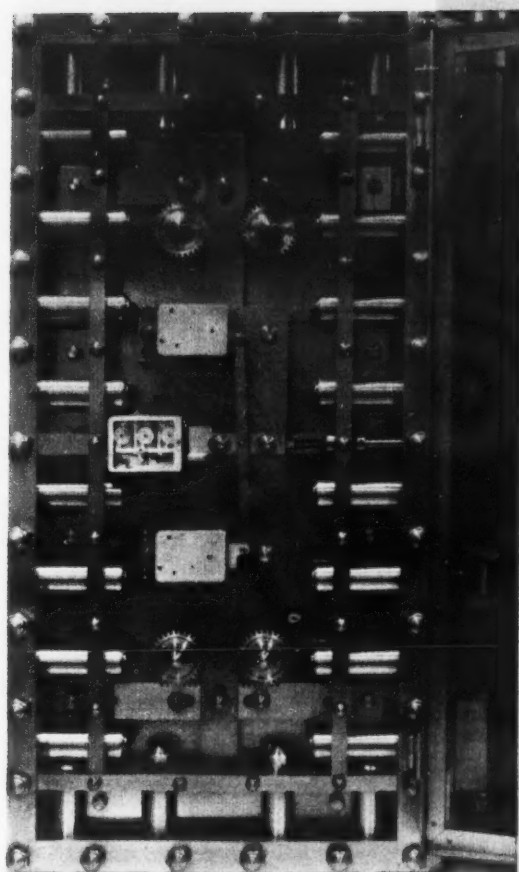
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A major commercial bank uses TDS for account updating and currency and bond transactions, as well as for loan and mortgage accounting. TDS speeds file inquiries and such complex calculations as securities evaluations, financial ratio analysis, and amortizations. The system links an online central computer to a network serving nearly 200 terminals, 1100 employees, and 33 branch offices.

TDS helps the bank keep its document production, circulation, and inquiries to a minimum, giving employees more time to do their jobs. And since the network shares a common data base, all personnel can obtain necessary information quickly and economically.

Transaction processing plays an important role at the teller windows. TDS enables tellers to record customer account transactions easily and update the data base. The teller or operator simply types in a message to begin processing a transaction. Service operations — check approvals, holds, or stop payments — are also handled by TDS. In a typical check transaction, the check is accepted or rejected immediately on the basis of the account status.

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Mini Bits

Slated for Nov. 17-19

Major Conference Set on Applications

Tape Drive for DG Nova Requires No Formatter

BOULDER, Colo. — The Model 103D interface system provides 1/2-in. industry-compatible tape storage for Data General Nova computers at a price comparable with cassette and paper tape systems, according to its developer, Rela Designs, Inc.

The interface uses programmed I/O transfers rather than the data channel, resulting in fewer components than in commonly available interfaces. The interface occupies one card slot in the Nova.

No formatter is required since this function is performed by the software provided. Special connectors plug directly into the Nova backplane, making installation simple, the vendor said, adding it will provide complete programming support for the system.

The interface circuit board is priced at \$900 and tape drives (Perc 5000, 7000 and 8000s) range from \$2,400 to \$3,800. The MSOS operating system (including Basic driver) is \$700.

The firm is at 1322 Arapahoe, 80302.

BDSC Offers Business Mini

PALO ALTO, Calif. — Business Data Systems of California, Inc. (BDSC) has introduced the BDS 0/100 business minicomputer system which consists of a 16K-word CPU, 12M bytes of fixed disk, a 24 by 80 character CRT and a 100 line/min printer.

A variety of equipment options are offered, including application libraries designed to tailor the BDS 0/100 for individual end-user requirements.

All system components are enclosed and tested in a desk configuration.

The BDS 0/100 utilizes a disk operating system called BDSOS and features Ex-basic, an extended Basic that supports up to eight users.

The BDS 0/100 is available in 30 to 45 days and is priced at \$17,500 in quantities of 15. The firm is at 260 Sheridan Ave., Suite 100, 94306.

Pryor Pak Holds S/32 Supplies

CHICAGO — The Pryor Pak 32 from Pryor Corp. is a mixed group of supply items in one package for the IBM System/32 user.

Packaged in one United Parcel-shippable box, the Pak contains 30 diskettes, 1,500 stock forms, five binders and six printer ribbons. It sells for \$232.

The box can be reused for storage if desired, the firm said from 400 N. Michigan Ave., 60611.

WASHINGTON, D.C. — A major conference on minicomputer applications in government, business and other organizations will be presented by the American Institute of Industrial Engineers (AIIE) here at the Sheraton Beltway Convention Center on Nov. 17-19.

Featured conference speakers include:

- Walter L. Anderson, associate director for the Automated DP Financial and General Management Studies Division of the U.S. General Accounting Office (GAO).

- Kenneth Harple, president of Modular Computer Systems.

- Kenneth Olsen, president of Digital Equipment Corp.

- Theodore D. Puckorius, commissioner of the General Services Administration's Automated Data and Telecommunications Service.

The conference is designed to promote effective minicomputer applications by attendees, the AIIE said. Successful minicomputer applications experience and "lessons learned" by users will be presented in overviews and case study workshops.

The new GAO study recommending expanded minicomputer usage in government agencies will be highlighted at the conference. Other plenary sessions presenting overviews of government and business minicomputer usage will focus on minis as extensions of centralized data processing, stand-alone, general-purpose systems, networks and dedicated systems.

Concurrent workshops are scheduled to present in-depth case studies of current successful minicomputer applications. Case presentations will be followed by

panel discussions involving additional user executives and conference attendees.

Scheduled workshops include:

- Stand-alone, general-purpose minicomputers.

- Minicomputers as extension of central data processing.

- Minicomputer networks.

- Intelligent terminals and minicomputers: data handling applications.

- Dedicated minicomputers: innovative applications.

On the final day of the conference, concurrent panel discussions are scheduled on minicomputer procurement, with one panel covering procurement by government agencies, another panel procurement by business and other institutions.

Procurement panel presentations and discussion will encompass check lists used before and after vendor selection. Special emphasis will be placed on effective follow-through with vendors after purchase.

The workshop on "Stand-Alone, General-Purpose Minicomputers" will cover minicomputers as an approach to decentralized data processing for the large user or as a total service for the smaller user. Applications software may be provided by central data processing, local programming or turnkey hardware/software acquisition.

The workshop on "Minicomputers as an Extension of Central Data Processing" will cover systems combining a large central computer with minicomputers or intelligent terminals having limited local processing capability.

The "Minicomputer Networks" workshop will cover systems involving distributed processing power without the use of

a large central computer — those based on minicomputers alone.

The "Intelligent Terminals and Minicomputers" workshop will focus on data handling applications, with standard or locally controlled programming, for transmission to central data bases. The "Dedicated Minicomputers" workshop will survey minicomputers in a one-application environment, including complete hardware/software systems designed for standardized multiple installations.

AIIE Seminars can be reached through P.O. Box 25116, Los Angeles, Calif. 90025.

Write Now

October is data entry month at *Computerworld*. And the Special Report in the Oct. 29 issue will cover the wide range of data entry with heavy emphasis on remote data capture.

The use of minicomputers is becoming a key part of the data entry function, and stories of successful installations will be a major feature of our special report.

You don't have to be a professional writer to tell of your installation or application in *CW*. Just send us a three- or four-page, typed, double-spaced note and explain what you had before, what you have now, why you changed, the advantages of the new system and just how effective the change was from a cost- or time-saving point of view. Our team of editors will take it from there. *CW* is at 797 Washington St., Newton, Mass. 02160.

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Small Brewery Finds Small System Lifts Its Spirits

HENLEY, England — It may be surprising that a local, small, privately owned brewery like Brakspear's here should need to computerize its accounting systems.

Brakspear's, however, in common with other small breweries, has special problems which only computerization can solve. After considering various alternatives, the company opted for an installation which has not only solved its accounting and management information problems, but has also allowed it to offset a large percentage of the costs.

Altogether the brewery has about 350 customers and processes some 50 invoices averaging 40 items each per day out of a stock base of about 900 items. Before computerization, customers sent in their orders and the clerical staff then had to prepare the invoices and bills of lading so the six lorries operated by the brewery could be loaded and ready to start their deliveries early the following morning,

complete with invoices.

The problem of returnable bottles and cases, which had to be sorted and calculated manually and debited or credited to the customer, was enormous and the brewery was slow in passing on these credits and debits.

Other Difficulties

There were other difficulties. The orders received by letter or telephone, for example, were written out by hand and often misread by unskilled labor in the cellars or spirit stores.

The brewery was also interested in obtaining certain management information.

Finally, the Burroughs Sensomatic accounting machines on which payroll, statements from invoices and bought ledger were processed were getting old.

In an attempt to solve these problems, Michael Chalcroft, Brakspear's managing director, looked at a variety of possible

machines from such companies as Bradma, Addressograph, Burroughs and IBM. But the machines, varying from calculators and ledger card computers up to a full-scale computer, were either too slow to produce the output management wanted in the required time or too expensive. IBM, for instance, quoted a price in the neighborhood of \$100,000 for a System/3 system.

It eventually fell to a local consultant, Dill Russell Ltd., to suggest a system based on a minicomputer. Dill Russell decided to use a Data General Nova 1220, as the center of the brewery's system.

Installed at the brewery early in June, it had 32K words of memory, two Diablo disks with 2.5M-byte cartridges, a Centronics line printer and two Olivetti TE 300 terminals.

T/S Bureau Standby

It is essential for all computer systems

to have some sort of standby facility in case the machine should break down. Dill Russell's standby concept is to use a time-sharing firm instead of a machine similar to the one installed.

In case of breakdown, the operator only has to plug a terminal into the modem which links it to the telephone lines and dial the number of the bureau on the telephone. Within 20 or 30 minutes, he can continue operation exactly as if he were using the minicomputer machine in the room next door.

Six weeks were spent in building up a customer and stock data file and then, for a week, the system was run by the local time-sharing bureau which did all the invoicing.

The bureau has a magnetic tape which carries all the brewery's basic data necessary for an emergency and which can be loaded into the bureau's own computer if necessary.

Six weeks were spent in building up customer and stock data file and then, for a week, the system was run by the local time-sharing bureau, which did all the invoicing. The brewery was operating a parallel run at the same time.

Two Processings Daily

The new system started operation in mid-June. Now, when the brewery's customers send or telephone their orders, they are entered onto a precoded form which gives a day code, customer code and item code. The orders are then typed up directly on the Olivetti terminals.

The paper tape output from the terminals is read into the computer, which immediately produces a six-part printout. The first part becomes the invoice; the second part the dispatch note; the third, fourth and fifth parts are the load notes which go to the beer, the wine and spirits and the soft drinks departments respectively; and the last part is an accounts copy.

The first lot of orders is processed between 10:30 and 12:30 every morning and loading is started so the orders will be ready for the first delivery the next day. The second batch of orders is processed during the afternoon, ready for the second delivery the next day.

At the same time that it is producing the invoice, dispatch and load notices, the computer is also updating the stock file by the amount depleted, setting up the open invoice file ready for statements and updating all the gallonage records against every pub, so that the brewery's management knows the breakdown between its own and others' beer, sold in gallons, by every pub.

All the bottles and crates which have to be billed to fill any order are automatically calculated and every invoice has a credit note, so there is a large credit system running as well. When the credits come back into stock, a credit note is issued and the bottles and cases are then invoiced out again.

The total cash business to date is also updated; this can then be tested against the credit limit of any customer. Batch transactions are posted to the temporary ledger and these are verified and sent through into the nominal ledger. From the postings to the nominal ledger, a complete sales ledger is created.

At present the computer run takes up approximately two hours of the working day. Eventually, when the whole system is fully operational with additional applications, it will occupy five hours a day.

The spare time is being sold to other users as a joint venture between Brakspear's and Dill Russell, which actually runs the computer for the brewery. Originally it was intended to offer an accounting service to local businesses, but two or three days after the Nova's installation several enquiries were received from other Data General users, and it looks as though the spare time may be fully utilized.

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Grumman printer controller costs less than IBM's.

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For multi-vendor installations we can add a switch to your controller to allow you to connect the IBM 1403 to either of two different computers.

You can rent, lease or buy both the printer and controller. For full information, call or write Joe McDonough, Grumman Data Systems Corporation, 45 Crossways Park Drive, Woodbury, New York 11797. (516) 575-3034.

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Publisher's System Reports Data On Products, Handles Accounting

SAN FRANCISCO, Calif. — Royalty accounting and product-line profitability are key features of the business computer system now in operation here at W.H. Freeman & Co., the textbook-publishing subsidiary of Scientific American, Inc.

"The system reports sales, cost of sales, royalties, promotional giveaways, and profit/loss by book — information never before available to us by product," according to Vice-President Adam Kudlacik. In addition to complex royalty accounting, including the printing of royalty checks, the system automates order entry and prebilling invoicing (6,000 invoices monthly, 70% of which are for Freeman's 4,000 regular customers), accounts receivable, sales analysis and inventory accounting.

Installation of the system software was handled by the Palo Alto, Calif., office of Informatics, Inc. Western Systems Co.

The system hardware was manufactured by Qantel and includes a Qantel System 1200, three video terminals (for input and inquiry), a 12M-byte disk drive (6 million of which are removable) and a 200 line/min hard-copy impact printer.

The system operates on-line, with or-

ders, cash receipts, inventory receipts and other transactions keyed in on the video terminals. Analytical summaries, accounting reports and check writing are output through the impact printer.

On-line inquiry into customer or inventory account status is available, and the visual display of information such as invoice amount, customer name and address and product description allows for data verification and correction at the point of entry.

Freeman publishes text and reference books, plus offprints of *Scientific American* articles as pamphlets in sets and bound collections. Its system replaces two billing machines, multifunction off-line processing by a service bureau and a variety of other business applications previously done by hand.

A TV Terminal in Every Home?

PHOENIX — A computer in every American home? For obvious reasons, that continues to be the dream of American computer manufacturers and the science fiction writers who trail in their wake.

But in a major planned community here, created by Rossmoor Corp., the dream begins to approach reality as installation continues on a two-way cable TV system that links each residence with an Interdata mini.

"In most cable TV installations, the traffic is one-way, as the black box on top of the TV set brings in more channels than would otherwise be accessible to the subscriber," explained Brian Belcher, director of engineering for Tocom, Inc. of Dallas, Texas, prime contractor for the two-way cable TV installation.

"However," he continued, "in our system, the terminal on top of the TV

set not only brings in more channels of TV programming, it also sends out information to the minicomputer.

The minicomputer, for example, will sample each terminal every six seconds for fire, police and medical assistance alarm information. Each subscribing home has two heat-detecting sensors and alarm boxes for police and medical assistance alarms. These devices are wired into the terminal, which stores their information.

If it receives an affirmative message regarding fire, police or medical emergency, the minicomputer automatically prints out an alarm message for the on-duty security officer, nurse station and fire station, along with the address of the problem home and instructions for appropriate response.

Subscribers may also participate in opinion-polling experiments by pressing five response buttons.

Mini Installation By Taxpayers' Group Improves Efficiency

MELBOURNE, Australia — The Taxpayer's Association here, which finds speed essential when checking on government decisions, soon will follow its "economy with efficiency" advice to government by installing its own computer.

Formed in 1919, the Taxpayers' Association is a service organization for its members, providing government representation, information and education services.

With the Data General Nova 2/10, subscriptions paid by members in all the Australian states will be handled simultaneously. The computer will recognize which state association is entitled to the money and will allocate it automatically.

Subscription notices will be issued centrally, with the program taking into account any special features of the subscription structure of the state concerned.

The association decided to buy the mini because growth in membership in recent years had overloaded manual and mechanical methods.

Every two weeks the association's journal goes to nearly 20,000 taxpayers, government departments and libraries in Australia and overseas. Producing journal wrappers in postcode order, expected to save money on postage, was virtually impossible with an addressing plate system.

The system, which will cost about \$90,000, including the programming, will have 64K bytes of core memory, two visual display units and a teletypewriter. Membership records, the library of programs and other information will be stored on a 25M-byte disk which allows for the association's expansion.

Magnetic tape will be used to dump the information from disk every two or three nights. Each day, any vital changes to the records will be recorded on magnetic tape so everything can be restored in minutes if there is a machine or operator error.

Extended Time-Sharing Basic will be the programming language, and the equipment has the capacity to handle a large number of jobs simultaneously.

A 300 line/min printer will be linked to a Bowe forms cutter. The two units will operate virtually in unison to deliver wrappers and other papers as separate, cleanly trimmed sheets with no perforations.

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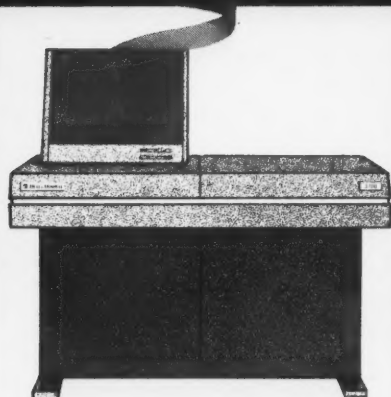
Our COM recorder is compatible with most computers now in use. It speaks virtually any computer language. Job setup is accomplished through the use of a single job control card. So human error is substantially reduced.

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In short, Bell & Howell's

entire COM program, from hardware to software to support functions, are focused on your way of doing business... not ours.

And a Bell & Howell COM system speaks your language in still another way; it costs a lot less than you might think. To get the word, write: Bell & Howell COM Products Division, 1451 Quail Street, Newport Beach, California 92660. Or call Pat Flynn, collect, (714) 752-1940.



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15-Year-Old Buys PDP-8

Age No Barrier to Ownership of Mini

EASTHAMPTON, N.Y. — Why do most teenage boys save money? To buy a 10-speed bicycle, perhaps, or a first car or, if they are practical, for college.

Eric Hahn, a sophomore at Easthampton High School on Long Island, already owns a 10-speed bicycle and, at 15, is too young to drive. He hasn't been saving for college, either, although what he purchased with his money will certainly help him get there.

He bought a computer.

Hahn gained his first exposure to computing about a year ago, using a school terminal tied into the Long Island Regional Interactive Computer System (Lirics) Project, a time-sharing facility. Almost immediately computers became an all-consuming interest with him and, during frequent evenings until 11 p.m., he could be found at the school's computer center, becoming familiar with computing languages and learning programming techniques.

Return for Investment

He has already begun to give to the school and community a return in services for his educational investment. Last fall he helped develop some special software for the ophthalmology laboratory at the local hospital, which owns a Digital Equipment Corp. PDP-8 minicomputer.

At school, he has been working on programs that will enable the time-sharing system to take raw data from weather stations' instruments and turn it into tables for the drawing of weather maps and forecasting by earth science students.

Independently, he has been developing a high-level language for the PDP-8 which, he said, "combines the features of the best languages I know and optimizes the features of the PDP-8."

As early as last summer Hahn resolved somehow to acquire his own computer, and he spent his vacation plus available evenings and weekends during the school year in a component assembly line at his father's electronics firm, stowing away each hour's wages toward the day when his dream would come true.

Large-Size Drives, Floppy Disk Systems Get Diva Reductions

EATONTOWN, N.J. — Diva, Inc. has reduced prices up to \$1,300 on its line of large-capacity and floppy disk systems.

The DD-25, a 127.4M-byte capacity, dual-spindle drive which includes a DOS I/O driver on paper tape or 800 bit/in., 9-track drive magnetic tape, is now priced at \$28,500.

The DD-23, a 63.7M-byte, single-spindle drive, has been reduced to \$17,990; the DD14/2, a 63.7M-byte dual-spindle drive, is priced at \$22,900; and the DD-14, a 31.8M-byte, single-spindle drive is now \$12,600.

The DD-23, DD-14/2 and DD-14 all offer the DOS I/O driver on paper tape or 800 bit/in., 9-track magnetic tape at no additional charge.

Diva's DF-100 floppy disk controller, which includes a microprocessor and a controller/formatter with 16 bidirectional data bus lines, is now being offered at \$2,095.

The floppy disk systems — DF-101, DF-102, DF-103 and DF-104 — have been reduced to \$2,995, \$3,750, \$5,300 and \$6,995 respectively.

These systems accommodate up to four drives and range in capacity from 3.1M bits to 12.4M bits. A DF-DMA interface is included with each system at no additional cost.

The firm is at 607 Industrial Way West, 07724.

"I had seen advertisements for cheap, used computers," he recalled, "and decided to try one. But it was a disaster. That machine was really dead. At least the computer exchange took it back without any argument."

Help From Higher Quarters

Disappointed but undaunted, Hahn wrote to C. Gordon Bell, vice-president of engineering for DEC. Hahn recounted his activities, included a sample of the language he is developing — he calls it the Advanced Computer Emulating System (Aces-8) — and told Bell of his dream to have his own computer and terminal "so I can work on these projects without interruptions."

Hahn said he had saved enough to buy a small PDP-8 at the discounted quantity

price for lots of 100 or more, but not enough to acquire one.

Bell responded first with a telephone call to Hahn to discuss his predicament and then contacted managers of DEC's Education Products Group for consideration. Earlier this year, the group, through Alice D. Peters, applications development manager, offered Hahn a PDP-8/M with Teletype terminal at terms within his reach — if he would deliver on his promise to pick it up at the company's headquarters in Maynard, Mass.

One thing Hahn's new possession is sure not to be idle. "I'm working on an advanced time-sharing monitor for the PDP-8," he said. "Our school wants to give kids in the mathematics department access to a computer, and I'm working on a plan that may allow them to use mine."



Teenage computer owner Eric Hahn examines operation of computer terminal in the company of DEC's engineering vice-president, C. Gordon Bell. Hahn visited DEC recently to pick up a PDP-8/M computer and terminal for which he had worked and saved.

GREAT COMPUTER SECRETS*



General Computer Systems, Inc.
GCS 2100 multifunction, multimedia data entry system.
Which we've never advertised.

Small System Provides Answer for Telephone Bureau

SANTA ANA, Calif. — How do you handle 5,000 accounts through 18 branch offices with monthly bills averaging \$45 and about 4% client turnover each month?

George W. Smith, president of Telephone Answering Bureau (TAB) found the answer when he selected a small business computer for on-site data processing.

Since its establishment in 1956, Smith has seen TAB grow in both size and

complexity. Serving Orange County and the nearby Los Angeles area, a TAB operator now performs over 40 different types of transactions, each with an appropriate unit cost.

Keeping track of many small items was cumbersome on bookkeeping machines, so TAB's first step toward DP was a terminal unit with printer.

Early in 1973, Smith teamed with Norm Hagelstrom, president of Business World Computer Systems here. Together they

developed a package of programs designed for the accounting problems found in a telephone answer bureau.

The program package was written by Business World in RPG-II and operates on a Lockheed System III business computer with two disk drives, 24K bytes of memory and a medium-speed printer.

All input is through the CRT/keyboard console and specially designed forms which are prepared for each client once per month. Charges are consolidated daily at each branch office and TAB has four billing cycles per month.

In Complete Control

"What pleases me most is that now, for the first time, I have complete control and insight into the operation of my business," Smith said.

One of the benefits he cited was classification and analysis of accounts. "We know where our new accounts came

from, and we know why they terminated service; we know their business classification or if they are residence accounts."

This brought improved response to TAB's computerized direct mail program and also reduced its cost. The system also includes usage reports by rate schedule, types of service and analysis of supplementary services.

Smith also gets a detailed 27-item monthly quantitative analysis report to evaluate performance of each branch office.

TAB has approximately 200 employees, of which only 11 are administrative. Smith said they have reduced their bookkeeping labor by 50% and now have closer control over labor costs.

Mini UPS Priced Under \$2,000

GAINESVILLE, Fla. — An uninterruptible power source (UPS) from Synergetic Scientific Systems, priced under \$2,000, is aimed at the small computer market.

Designed to give minicomputer users the same protection normally justifiable only on larger systems, the unit can supply

115 VAC or 230 VAC to a 1,000W load for either 15 or 30 minutes.

The output is both voltage and frequency regulated, according to the firm.

Synergetic Scientific Systems can be reached through P.O. Box 926, 32602.

For the past four years we've been developing our powerful GCS 2100 system and building its software support and service program. And we've never taken the time to tell enough people what a great system it is.

How efficient it is (average of 80% reduction in errors—35% to 85% faster document handling).

How reliable it is (less than 1% downtime).

How simple it is (operator training time less than 8 hours).

Or how economical it is (10%—40% savings in data preparation costs).

And our competitors have loved us for keeping it such a secret!

The GCS 2100 is a complete data entry system: it lets you collect and edit data at the source (data is actually edited while it is being keyed).

Store the data on disc. Then transfer the clean data to an output media like magnetic tape.

(Conversely, data already on tape or cards can be re-submitted to the GCS 2100 for editing, reformatting, etc.)

By editing input data before it goes to disc storage, the GCS 2100 lets you quickly spot errors that could have become costly.

The GCS 2100 can interface up to thirty-two Touch-Tone® telephones. Card readers. Medium and high speed line printers. Four-tape drives. Four fixed or moving head discs.

All on a single system.

The GCS 2100 provides extensive I/O functions that allow you to transfer data to and from disc storage and other I/O devices, and provides an audit trail (comprehensive statistical reports aid in monitoring the system and the operator's performance), all with minimum impact on a supervisor's time.

The GCS 2100 can accommodate up to 64 local or remote terminals: local terminals can be located up to 2500 ft. from the system's CPU. You get faster, more accurate data entry for functions like payroll, shipping, receiving and manufacturing, because the person most familiar with the data does the keying. (Note: we can supply a typewriter keyboard and a special CRT format so this person doesn't have to be a keypunch operator.)

In addition to data entry from local terminals, the GCS 2100 offers data entry from remote terminals (it can handle up to five remote terminals over one dedicated telephone line); Touch-Tone® data entry; remote batch communications; and word processing.

A Programmable Extension Package (PEP) extends the power and the flexibility of the 2100 system:

up to 255 PEP tables provide capabilities like automatic data insertions; range and value checks; table look-ups; logical tests; character expansion (the operator keys S.D., South Dakota is generated on output); and automatic format switching.

And because these tables are not job assigned, they can be used on several different jobs. (Note: no programming experience is needed to work with PEP.)

A library of over 100 special edits is also available. It handles things like field relocation; special balancing routines; manipulation of constants; and output editing requirements. (If there isn't an edit for your needs, we can design one.)

The GCS 2100 also provides up to 99 format levels per job; up to 255 balance accumulators; variable length record and blocking factors; and up to 255 jobs stored in the system.

GCS DataTel: provides remote batch communications capabilities between the GCS 2100 systems and other 2780-compatible terminals and mainframes. And since the batch transmission of data is directly from disc to another mainframe, the usual step of transferring data to tape can be eliminated.

GCS DataTone: is a low-cost, efficient and convenient method for collecting numeric data from remote sites. It is designed for updating inventory, shipping documents, orders, etc.

DataTone answers automatically and handles up to thirty-two incoming lines at once.

With DataTone, the GCS 2100 system can accept incoming telephone data without interrupting data entry from the terminals.

GCS DataText: is a multi-purpose shared-processor approach to word processing. Designed for high-volume typing requirements, it is a fast, efficient, low-cost method for producing customized letters, envelopes, forms, labels and reports.

And since DataText uses a disc library, manual handling of storage media like cards, cartridges, etc. is eliminated.

If you'd like to get in on more Great Computer Secrets, contact your local representative or Tom O'Brien, Director of Domestic Sales at General Computer Systems, Inc., 16600 Dooley Road, Addison, Texas 75001. Call (800) 527-2568/9 toll free or (214) 233-5800 within Texas.

GCS 2100
GENERAL COMPUTER SYSTEMS INC.

Two PDP-11 Models Get Add-On Memory To Double Capacity

BEVERLY HILLS, Calif. — An add-on core memory system that can double the capacity of Digital Equipment Corp. PDP-11/15 and PDP-11/20 computers within their available chassis spaces is available from Litton Memory Products.

The Litton LM-820 is an 8K-word by 16-bit core memory system which is pin-compatible with both DEC models, the firm said.

Maximum storage capacity of 32K words can be achieved by using four of the available memory card slots within the computer chassis. This is accomplished through the use of a connector block designed to fit into the chassis spaces.

Because each connector block accepts two LM-820 memories, two blocks will accommodate the full internal memory capacity of these models without the requirement for extra equipment or power sources, the vendor noted.

The LM-820 core memories have a cycle time of 650 nsec, an access time of 280 nsec and 86-pin, edge-type connectors, the firm said.

Litton is at 360 N. Crescent Drive, 90201.

Mini Helps Design, Build Circuit Boards

GLEN COVE, N.Y. — Photocircuits Corp. bought a minicomputer to help design and build Multiwire circuit boards, but now everyone wants to get in on the act.

The company takes the circuit board specifications required by customers and develops the most efficient design using a Hewlett-Packard HP Model 3000CX minicomputer system and special in-house programs.

After the results are drawn by a peripheral plotter and given final approval by the customers, the design data is recorded on paper tape. The tape is then fed into numeric-controlled wiring machines.

The Model 3000 replaces two older computers, according to Michael B. French, director of computer engineering.

"We were reaching the point where the pair of older computers just could not keep up with our demands, and the upgrading needed was too expensive," said French.

"We are now not only at full operation, but have even expanded our capabilities. With extra terminals and acoustic couplers, programmers can now work on new programs at their desks, instead of within the hectic computer room.

"In fact, as a result of our purchase of the mini, the entire company has become computer-minded. Taking advantage of the system's time-share capabilities, a number of other departments, like engineering design and inventory, are renting terminal time," French said.

Streamlined System Speeds Bank's Trust Operations

ROCHESTER, N.Y. — In trust operations, Lincoln First Bank of Rochester designed its own automated system to insert a minicomputer interface between the original receipt of assets and its Computerized Trust Accounting System (CTAS).

The streamlined system made it possible to slash the time needed to open trust accounts by more than two-thirds.

Manual preparations were a slow process, said James A. Austin, assistant vice-president of trust operations. They often involved as many as five people and required the rearrangement of the same information as many as four times to satisfy the needs of the various functions through which it passed.

It was slow, and error-prone, since the information had to be recorded many times by hand, he said.

In all, it took about 10 days from the original receipt of the securities until the

assets were recorded on the computerized trust accounting system, Austin noted.

Using an NCR 399 accounting computer, the bank established its own mini data processing unit in trust operations. At the same time, systems analysts took a hard look at the paperwork and procedures.

In most cases, the various forms required only a reformatting of the same information, so a standard five-part form was designed to replace them. If reformatting is necessary, it now is done with the minicomputer.

Data concerning customer identification, name and numbers of securities and transfer instructions now is entered on tape upon receipt of the assets. Once the assets are delivered to the minicomputer operator, he keys the basic data onto tape cassette and commands the machine to print out the standard five-part form.

Within minutes, one copy of the form

goes back to the customer and another accompanies the securities to the vault. The securities are placed in the vault the day they are received.

For any subsequent functions, the data now is on tape and can be recalled and changed as needed.

Another copy of the form is sent to the pricing unit, which establishes the inventory value of the assets. Once the prices are returned to the minicomputer, the operator recalls the basic information from the tape and inserts the values through the keyboard.

The memory is programmed to then type out the transfer form and automatically punch the input cards for the main computer that will update the CTAS.

Recopying of the information has been eliminated, including input data for the main computer, because the information is machine-available. This eliminates

many possible errors, Austin said.

Sets Up Assets Values

Under the manual system, before the securities could be entered into the main computer, the inventory value of the assets had to be established. It was more efficient to wait for the values and key-punch the cards only once.

However, because the keypunching now is an automatic by-product of the minicomputer's operation, this policy was changed. If the values are not available within three days of the receipt of these securities, cards now are punched to set up the assets at nominal values for the CTAS, and the basic account information is retained on tape.

When the values do come through, new cards are punched which modify the data in the main computer. This makes it possible to set up assets within three days instead of the 10 days it formerly required.

The program, major security names and numbers and transfer agents' names and addresses are read into the computer's memory from tape cassettes.

To print out the name and address of a prime security or a transfer agent the operator keys in a single code number at the appropriate point in the program and the 399 automatically prints it out in the right place on the form.

The minicomputer is equipped with two tape handlers. After the program and constants are read into the memory, a master tape cassette containing data on all accounts in process is mounted. A blank tape is mounted on the second handler. When data is added or modifications are required, the operator calls up the account by code number.

The minicomputer then writes all previous data on the master tape to the blank tape. The operator keys in the modifying data, which is then recorded on the new tape. Thus, nothing is lost and the new data is recorded in sequence.

After completion of the new entries, which may number up to 150 a day, the rest of the data on the master is written on the new tape automatically, and a new master is created containing the latest transactions.

If the entries are to be released to the CTAS, the system instructs the operator to insert the transfer form, types it out automatically and, with its keypunch peripheral, punches the cards.

While the minicomputer speeded up the entry of securities and reduced the number of "people hours" required, it had time available for other applications. The bank piloted it on estate accruals to provide more meaningful reporting to the Personal Trust Department, Austin said.

For The Twin Cities — A Hospital Data System That Delivers:

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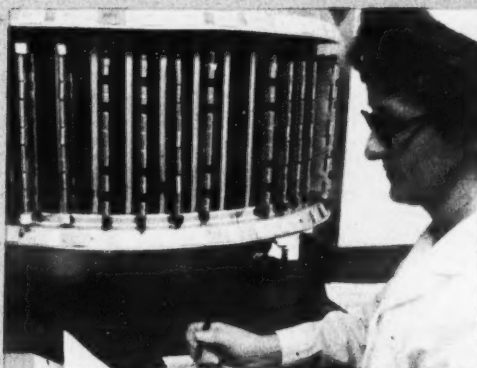
The Hospital Services Division of McDonnell Douglas Automation Company serves the data processing needs of America's health care industry. In fact, McAUTO works for more hospitals than any other company of its kind.

In a growing number of hospitals, McAUTO is turning to the power, speed and flexibility of INCOTERM Intelligent Terminal systems to dramatically reduce the costs of hospital data collection and management.

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Sales and customer service offices in major cities throughout the United States and abroad.

Facit Addo Tape Reader, Spooler Added to 4020

GREENWICH, Conn. — Facit-Addo, Inc. added the 4023 optical tape reader and the 4014 servo tape spooler in a rack mount unit for full tape-handling capability as an addition to its 4020 line of optical tape readers.

The 4023 and 4014 may also be incorporated individually into any system, but are especially designed for use in combination.

The Facit 4023 is equipped with electronics which permit the reading direction to be reversed at the desired character. It also features a lifter solenoid for the pinch roller, which permits reading during high-speed spooling in either direction.

Among the features of the Facit 4014 servo tape spooler are a push button for manual high-speed spooling at an average speed of 1,200 char./sec.

The unit is priced at \$2,290 from the firm at 66 Field Point Road, 06830.

Computers At Work In Education...

So what if, by 1984, computers will be used in 50% of the nation's elementary and secondary school classrooms? Do they work? What are some instances of advantages and disadvantages stemming from the use of computers in education?

On this and following pages, *Computerworld* looks at a few of the successes and discusses some of the failures recorded in the annals of computer-assisted instruction (CAI) and related automated efforts in the educational field.

In addition, this month's mini-report includes stories on authorship and a system that swears only when sworn at.

Have Schools Found Them Worthwhile?

Mini Plus Math Multiplies Pupils' Interest in Division

• Yes...

By Edith Holmes
Of the CW Staff

CHICAGO — Two Chicago-area elementary schools have discovered minicomputers prove excellent drillmasters when it comes to teaching young children basic arithmetic facts.

The computer-assisted instruction system takes the tedium out of learning multiplication tables and the like by providing kids with immediate results in hard-copy form, including the average time spent per problem, according to Walt Weller of Automation Software Associates here, author of the system's de-

sign and software.

"As generations of school children and teachers who must grade them can testify, the business of repeated drilling until the child responds automatically has always been boring and oppressive," Weller said.

Seated at a Teletype, however, "children learn faster because the techniques employed make the whole process interesting to them," he added.

Dubbed Henry VIII and controlled by an LSI II Naked Mini from Computer Automation, Inc., the system provided an unexpected benefit by being particularly attractive to children with learning disabilities, he said.

These students, who are not mentally

retarded but have learning handicaps such as dyslexia, can work at their own pace, facing one problem at a time. They have sharpened their arithmetic skills as a result, Lola J. May, mathematics consultant for the northern Chicago suburb of Winnetka, said.

Weller's system supports a single terminal in Winnetka and three terminals at the Daniel Boone School in Chicago. Last year, he noted, the 120 children using the system at Daniel Boone worked over 200,000 problems.

"Kids typically do 150 problems in 15 minutes and, by the end of the year, were fighting over the terminals to do them," he said.

The system allows the student to inter-

act with a terminal which types out arithmetic problems, generated by the mini at random and at the level appropriate to the child's knowledge, he explained. The student responds by typing the answer; if it is correct, a new problem is typed or can be displayed on a CRT, again at random.

If the answer isn't correct, the problem is retyped with the appropriate answer. The child has five seconds to study the problem before a new one is typed.

The error is stored in the mini's 8K core memory and, within the next eight problems or so, reappears to test whether the student remembered the correct answer. Weller explained the system can store six such errors, feeding them back to the child at random intervals in between the programmed problems of the drill.

At the drill's end, the child receives a printout of the exercise, the problems missed, a percentage grade for performance and the average amount of time each problem required.

May noted the children love to walk away with that piece of paper showing what and how they have done on the drill. Teachers appreciate the self-grading feature because of the time it saves them from a boring and routine task, and they can use such facts as mean time per problem to help slow students who may be solving problems by counting on their fingers, she said.

The teacher can also control the level of difficulty of each drill, Weller said. Twenty-nine levels of drill are available, including six addition, five subtraction, three multiplication, four division, four enumeration and inequality and seven

(Continued on Page 56)

District Questions Validity of Activity Printouts

• Maybe...

By Edith Holmes
Of the CW Staff

MUNCIE, Ind. — Parents and teachers of 300 children beginning kindergarten at four elementary schools here this month will soon receive printouts of priorities and activities customized to fit each student's learning needs.

Based on a screening program designed to spot potential learning and behavior problems as soon as possible, the computer program takes the results generated by a series of perceptual and motor tests and prints out the items parents and teachers first need to concentrate on with the child.

The list includes those specific activities most likely to improve the student's performance, according to Fred R. Glancy Jr., director of the program, called "Insight Unlimited."

But while this use of automation to help educate may be sound, controversy over the real connection between motor and perceptual skills and, for instance, reading ability, could also cast doubt on the validity of computer use in this instance.

Those in favor of screening contend it holds great promise for those whose perceptual and motor problems make it difficult for them to learn in school, which in turn limits what they can do when they leave educational institutions. And those opposed to the plan fear many children who are simply troublesome or difficult are being labeled with learning handicaps that might be self-fulfilling in the long run.

But those responsible for computerizing test results to provide teachers and parents with a plan of action for each child screened are chiefly concerned that the output generated will be intelligible and of some use. "After all, we're doing this for the kids," Dick Robinson, president of Resource Systems, Inc., the firm creating the software for the information system, commented.

Compiling Data Base

Muncie's Delaware Community School Corp., which runs "Insights Unlimited,"

has screened nearly all 4,000 elementary, middle and high school students in the surrounding school districts. The results of the series of tests each child goes through form the basic input data, according to Robinson.

The data base from which learning priorities and activities are drawn comes from a compilation of all available information on what training activities will tend to improve what performance in the classroom. This information was put together by the staff of "Insights Unlimited" and handed over to Robinson and Resource Systems, according to Glancy.

The eventual result of these inputs will be an on-line retrieval system any school district in the country can employ, given the necessary hardware, Glancy said.

Robinson noted that, at this point, some 46,000 pieces of test and data base information have been keypunched into the system and are coded on tape. Working in Cobol up to this point, "we blitzed the program first to get as much as we could into data entry. Now that we've entered it, we're retrieving it to see what the information looks like," he said.

"Once we've decided how to modify output format and language to make that information comprehensible to parents and teachers, we'll correct, test and debug all our programs," Robinson added.

Currently in the process of making output information understandable for those applying the remedial programs, Resource Systems also plans to move the system from an Indianapolis computer center to the Purdue University computer system.

Robinson noted that, once output needs have been clarified, he and his staff will determine what combination of hardware, software, storage and retrieval will best accomplish the job.

The two kinds of priorities and activities lists that will be generated by computer — one for teachers and one for parents — won't identify the problem the test results revealed, Robinson said. They'll simply provide some potential solutions. In this way, each child has a customized program based on limitations as well as abilities, without an undue emphasis placed on problem areas.

All the computer does here is automate

the recordkeeping process on each child and make available to parents and teachers the full range of information on what can be done to help improve skills.

Noting that teachers are often scared by automation in their classrooms, Robinson said some of his chief concerns in designing the output will be to make it "efficient, easy and dramatic. We want teachers to be comfortable with this information so they will adopt the program on a regular and consistent basis," he added.

Funded by federal monies under Title III of the Elementary and Secondary School Act, "Insights Unlimited" received \$180,000 last year and another \$50,000 this year, according to Glancy. It has a total of three years in which to prove itself.

Lack of Funds, Terminals Cause System to Flunk Out of Classes

• No...

By Toni Wiseman
Of the CW Staff

REDDING, Calif. — The computer has been heralded by some as the greatest boon to education since colored chalk.

Others, however, think the computer has flunked the test.

While the philosophy of computers in education was implicated, the lack of sufficient funds and equipment were the main reasons for the discontent voiced by teachers in the Enterprise Elementary School District here.

According to a report published in a local newspaper, 19 teachers said the computer was an asset to their teaching while 61 said it was not.

The reasons for the dissatisfaction were several, according to superintendent Gilbert Goetz.

"There were some teachers who were dissatisfied because they felt we were drawing funds which might have been used for other educational purposes," he explained. "Others objected to the me-

chanical, dehumanized nature of the computer."

In a related complaint, some instructors thought the use of a computer "smacked" of programmed learning, a technique of which many teachers disapprove, Goetz said.

"I have a reservoir feeling that the philosophy of computers in education hasn't been accepted because of the mechanical nature of the device," he added.

But the main reason the computer flunked was financial, he noted, citing a lack of funds to run the computer to its full capability.

"The system was not meeting the requirements we felt it should," Goetz said, "and this was due to the fact we could not provide the information or the equipment the teachers needed to realize its potential."

The system had been financed by a federal grant to test its effectiveness as a test-scoring and recordkeeping tool designed to leave teachers more time to work with the students.

When the funding ran out last year, (Continued on Page 56)

T/S Math Program a Matter of Self-Defense for Dad

CHICAGO — What would you do if, every afternoon at 3:30, a bunch of kids congregated in your office to use a mini-computer to practice their arithmetic problems?

Walt Weller decided the time had come to write a time-sharing version of the system he had constructed for his own children to help them improve their basic math skills.

Now the children gather around Teletypes located at two Chicago-area schools at 3:30 or whenever they think they'll be able to work a drill in addition, multiplication, subtraction or division on the machines.

Running Automation Software Associates from an office located in his home, Weller said his specialty is exotic computer applications, particularly those for

industry and medicine. The program for his children and the schools represented the first thing he's ever done in education, he added.

He hadn't particularly planned to get into the field; it just happened. "One day my eldest son came home from school, and I asked him something about his multiplication tables," Weller recalled.

Then nine years old, "my son responded, 'Oh, Dad, we don't do that any more.'"

"I went right through the ceiling."

With a little research, Weller discovered that, during the preceding 10 years, arithmetic achievement in American schools had dropped one full year. Attributing much of this to "new math," a program strong on concepts and problem solving but weak on memorization and rote learning, he set about devising a way to help his children improve their basic math skills.

"We acquired an old Alpha 16 and a purloined office desk," he said. "I removed the drawers from one side of the desk, replaced them with a rack and set the minicomputer in the rack on its side."

With the aid of a teletypewriter hooked to the mini, the children practiced their drills — and enjoyed the exercises. Before long, Weller's son's teacher was introduced to the device, and she began sending kids over to the office after school for extra help.

"Living just one block from the school, my lab was soon filled with kids every afternoon," he said. "That was fine, but it meant I couldn't get any work done. And that tended to put a strain on my livelihood."

So he sat down again and converted his programs into a time-sharing system that would be economically feasible. "We found a private angel to fund the hardware — an LSI II Naked Mini from Com-

puter Automation, Inc. and three 10 char./sec Teletypes," he said. Weller himself has never made a nickel on the project.

The system is entering its second year of operation at the Daniel Boone School in Chicago. Weller has continued to make improvements to the programs and hopes to add exercises on the metric system.

With some kind of upper- and lower-case teletypewriter and a mass storage device, Weller noted, he could write programs for foreign language drills as well.

Also in use at a school in Winnetka, a northern suburb of Chicago, Weller's system is such a hit with the kids "they act as if somebody died whenever there's a breakdown," according to Lola J. May, mathematics consultant for the town.

Commenting on his efforts, Weller remarked, "Children are human beings and they deserve to be taught by human teachers. I'm not an exponent of automation in education, except where the information is the kind that can only be learned by rote."

Mini Perks Interest In Arithmetic Facts

(Continued from Page 55)

fraction exercises.

Student results are recorded internally in the system for later examination by the teacher. The teacher can request a report which identifies the child, the text exercise, the number of problems in the test, the percent correct, the time spent per problem and the date on which testing was done, he commented.

Records can be kept for 250 children this way, relieving the teacher of a considerable amount of recordkeeping.

A true time-shared system, the mini can support as many as 12 terminals with no mass storage of any kind and can be adapted to any other available terminal, Weller noted.

Late this fall, the participating schools will have collected enough data on the children's performance to determine just how much the system has helped them sharpen these skills, he added.

System Flunks Out

(Continued from Page 55)

however, the district had to ante up \$34,000 a year to finance the operation.

A survey of teachers and parents, as well as an in-depth analysis, were conducted to evaluate the system. This evaluation led to the termination of the project, Goetz said. "We couldn't justify the funds."

"I regret that we're no longer able to provide this resource," he said, "but it was instituted as an innovative program and such programs are often not all they should be. It could have been much more effective."

Goetz revealed, for example, that not all schools in the district had terminals.

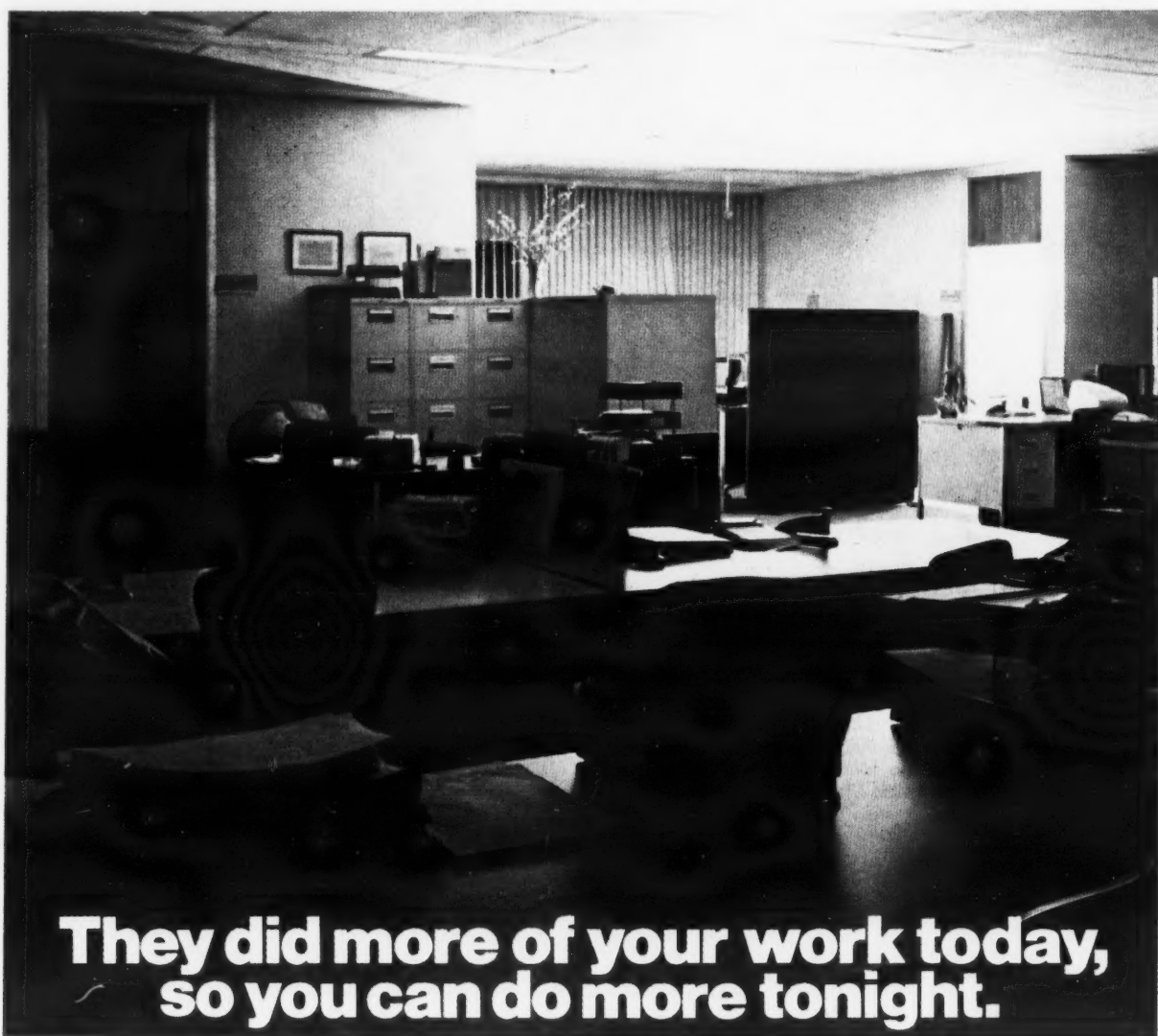
Those with terminals could have their students run their own tests in programmed subjects such as math, reading and science and receive instant feedback, while teachers in schools without terminals used the computer to score batches of tests and get mass results.

All testing and recordkeeping will now revert back to the manual system, Goetz said.

Goetz is still a proponent of computers in education. He noted that, while this project failed, the single experience does not mean such efforts will never succeed.

"But," he added, "if such a project is ever offered to us again, I will approach the whole thing differently. There will have to be terminals readily available for every school, and a clearcut plan for implementation."

"Most of all, there will have to be a clear-cut plan for funding."



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The new MDS System 2300 lets the people who create your workload handle some of the load.

System 2300 is an intelligent programmable terminal which gives you the efficiency of document preparation and simultaneous data entry, where the data originates.

Your programmed instructions are displayed in plain English on the 2300 CRT and guide the operator through forms preparation. The result is properly prepared data waiting for automatic transmission to your central processor. Data and forms are prepared in a single, error-free operation on System 2300 by your existing clerical personnel.

At night the 2300, in unattended mode, sends selected disk stored data to your Network Controller or CPU. And processed results are delivered to your terminals overnight. System 2300 can satisfy your local, central and network objectives. It can do it faster, more accurately and with greater flexibility than any previously available system. With intelligent data entry and document preparation handled remotely during

the day, you reduce the processing load on your computer center.

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*Documentation available on request



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CPU Programmed to Go to Hell, But Not Dedicated to Obscenity

By a CW Staff Writer

AKRON, Ohio — A morally upstanding computer system at the University of Akron understands and responds to assaults of students' curse-laden verbiage without getting too heated up.

For example, if a student types, "Go to Hell!" on the IBM 3270 CRT terminal, the system retorts, "OK, you asked for it!"

Computers At Work In Education

A note then appears on the screen, which reads, "The computer has gone to Hell." The system signs off, forcing the astounded student to sign on again, according to Tim Taylor, assistant director of the computer-assisted instruction (CAI) center here.

Taylor emphasized the above discourse is one of the less volatile. The university's multipurpose IBM 370/158, however, isn't dedicated just to obscenity.

Programs for both the introductory course to the school's CAI program and the statistics course are the only ones where the IBM Coursewriter language allows obscene quips, Taylor said.

The use of swear words is for fun, he noted. It makes learning the ins and outs of computer use even more adventurous and brings levity to the statistics course.

When asked if CPU time was wasted as a result, Taylor said the novelty wears off after a short time, and students who play with the system often can be spotted by the center's staff because there's too much laughter.

'Aset' Lets Teachers Write Own Lessons

BLUE BELL, Pa. — Teaching may be easier for instructors at all levels of education this fall with a software program for individualized computer-assisted instruction (CAI) from Univac.

Instead of depending on the traditional prepackaged CAI curricula, teachers can organize and develop their own lessons and drills or modify those created by others.

And the Author System for Education and Training (Aset) allows instructors in education, industry, government and other fields to develop automated training programs to meet their specific needs without formal knowledge of computer programming.

Using Author language, an English-type language developed by Univac, the instructor enters two basic components into a terminal — tutorial text and a command section.

The author may elect, for example, to write four or five frames of tutorial text and then a review frame. Or he may follow the tutorial text with drill questions.

He also has the option of programming the lesson so that an incorrect answer triggers a return to the pertinent section of tutorial text. The Author can also code for two trials, then supply the student with the correct answer and ask the question again later in the program.

The program also collects data for the instructor to use in evaluating a student's individual progress or that of a class as a whole.

An additional Aset release, scheduled for January, will add graphics capabilities to the instruction, according to a Univac spokesman.

The program requires 9K of core plus 1K for each additional terminal, according to Univac.

Aset is available to all Univac 1100 Series users under the 1100 operating system. It will be licensed for \$375/mo.

"If students are in stitches all the time, then you know they're messing around," he said.

The CAI center supports about 40 courses, including a majority of math courses and courses in English, psychology, natural science and guidance, among others, Taylor said.

There are a total of 12 Model 3270 CRTs (two have light pens) and two Anderson-Jacobson (AJ) portable teletypewriter terminals which can be used at off-campus locations through a standard telephone interface, he noted.

The AJ terminals, he said, can be used to access the verbally spirited system from another university during a demonstration.

And Taylor said he's done exactly that, just for the Hell of it.

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A special supplement on Source Data Entry - in the October 29th issue of Computerworld.

What used to be the exclusive domain of the keypunch operation has become the object of a confusing mass of systems, varying from card punch to OCR to distributed data entry and new, hybrid systems. This special supplement, edited by Vic Farmer, will analyze the many data entry applications in use today. Special emphasis will be given to capturing data at the source. It's projected to be the biggest CW supplement of the year, and it will be filled with applications stories, tutorials and viewpoints from users and experts on data entry. You'll see articles on subjects like these:

- Key-to-disk and key-to-tape
- The effective use of turn-around documents
- On-line data entry
- Terminal systems
- Distributed data entry
- Customized turnkey systems
- Optical Character Recognition systems
- New "Hybrid" systems - combinations like OCR and keypunch

If you're involved in the data entry process at your organization you should key in to this special supplement in the October 29th issue of Computerworld. And if you're a marketer of data entry products or services, your ad should be there. Don't miss the October 10th ad closing date. Contact your Computerworld salesman for complete details. Or call Judy Milford at (617) 965-5800.



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Benefits and Bane of CAI Felt in High School, College

By John Hebert
Of the CW Staff

Computers and terminals in a Maryland school system and a Texas university represent the growing use of automation to teach students of all ages.

Among the longer-lived examples of computer-assisted instruction (CAI), the efforts of Montgomery County Public Schools (MCPS) in Maryland and the University of Texas at Austin illustrate both the benefits and the bane of CAI programs: individualized instruction for students and a more efficient use of teachers' talents on the one hand and a struggle for funding support on the other.

At MCPS, computer systems have been used to supplement conventional instruction since 1968, according to Catherine Morgan, director of the CAI program headquartered in Kensington, Md.

In that year, four IBM instructional assistants working on an R&D program funded by federal Title III funds implemented a CAI program using an IBM 1500 system, Morgan said.

In June 1971, federal funding was terminated, but local funding allowed the continuation of MCPS' CAI program.

Today, the school system has an IBM 370/158 dedicated to time-sharing for 91 student and administrative terminals in classrooms and learning laboratories in 20 elementary and secondary schools. The computer capability is used to supplement and manage math computer literacy social studies and remedial and language arts courses, among others, in a variety of grade levels, Morgan said.

Morgan believes the use of the computer system is changing the educational process at MCPS. The primary goal in all 20 schools, she explained, is the individual, and this is where computer capability is most important.

"I used to be a math teacher. I couldn't go back to teaching the way it was before," Morgan said. "There's no way you can do the things that are really necessary when you are alone with a class of 30 or 40 students."

In addition, the computer system allows the teacher greater insight into problem areas because it acts as a continual monitor, demonstrating where each child "is" in terms of progress.

In Morgan's view, what the educational computing community as a whole "really needs is about two to three years more funding support. Manufacturers will see a market is there" if CAI in public schools is to keep up at the present rate, she said.

At the University of Texas at Austin, a Control Data Corp. 6400/6600 Taurus system dedicated to time-sharing for administrative functions has also been serving instructional needs since 1971 for the university's computer-based education program (Project C-BE).

Local computation for the project, funded by the National Science Foundation (NSF), and serving 29 courses ranging from zoology to aerospace engineering, is accomplished by a Data General Nova 840 CPU with 48K memory on dual disks and two Nova 820 acquisition systems, a spokeswoman said.

The four-year endeavor was aimed at exploring the effects of computer-based instruction at a large university. Project C-BE has received over \$1.6 million in NSF grants since its inception,

she added.

But NSF support was terminated last month, and the university must cultivate new funding sources.

This may prove a difficult task because of the large scale of the project. Courses in the humanities may suffer a reduction or a loss of computer capability because subject matter is less concrete and, therefore, harder to apply than in the pure sciences, according to Susan Wittig, assistant professor of English at the university.

Wittig considers the use of computer capability a real boost to teaching the university's freshman English course, "typically the problem course in the English curriculum," she said.

Using Datapoint 3300 CRTs to present instruction modules, sentence syntax can be taught in an interesting and productive way, Wittig said. Seven computer-tutorial programs in English syntax have been used to supplement the course work of 150 students.

Students in the course are ex-

pected to develop retention skills — not having hard copy as reference — and put learned concepts into subsequent writing assignments, Wittig noted.

The use of the automated system has had the "effect of concretizing subject matter in the humanities where everything is not cut and dried."

"Once the student sits down at the CRT terminal, both student and instructor perceive difficulties in teaching methods that were never imagined before," Wittig said.

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To Bridge Gap With Congress

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By Catherine Amst
Of the CW Staff

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Iowa); Dr. Brockway McMillan, vice-president of military systems, Bell Laboratories; Dr. Ruth Davis, director of the Institute for Computer Sciences and Technology, National Bureau of Standards, U.S. Department of Commerce; and Dr. Allen Newell of Carnegie-Mellon University.

Their remarks centered around the theme "Information Processing as a National Resource."

Culver remarked that Congress remains a "computer backwater" in the effective utilization of DP technology, despite the rising level of consciousness among increasing numbers of its membership.

"Too many legislators are under the deep-seated impression that there can be no useful marriage of computers and the legislative process," he said.

DP professionals must, however, consider the needs of Congress with a sense of realism," he added. "Computers cannot relieve the congressman of the pains of decisions, of a congested calendar or of the multitude of demands placed on him."

"But computers can provide him with some navigational aids which we don't have right now. And they can help achieve a more rational use of the resources we do have," he said.

Optimizing resources was also stressed by McMillan, who said the central question is not "what kind of gadgets we are going to have, but rather how effectively we use them."

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"We have a highly interactive technology that affects every one of us in our daily lives," she said, "and we do not know how to deal with it. The people who are making the policies generally

are not the scientists and technologists, and yet the changes we see today are generally caused by science and technology."

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Westin to Keynote ACM '75 Meeting

MINNEAPOLIS — "Computers and the Quality of Life" is the theme of ACM '75, the annual conference of the Association for Computing Machinery. The conference is scheduled here for Oct. 20-22.

Dr. Alan F. Westin will open the conference with a keynote speech addressing "The Next Decade of the Computer Revolution: Privacy, Participation and Power." Westin is currently professor of public law and government at Columbia University and served as a consultant to the Senate Committee on Govern-

ment Operations, which drafted the Senate bill that ultimately was enacted as the Federal Privacy Act of 1974.

The conference's technical program will emphasize panel and tutorial sessions considered of general interest to most ACM members.

The program will consist of 60 sessions, including three on microprocessors; four on computer networks; two on data structures and computational practice in mathematical programming; a debate on high-level languages; a panel on memory

management and operating systems; a variety of tutorials, including a demonstration of four symbol-manipulation systems; and several sessions devoted to software management and documentation.

Special Features

Special features of the conference include the Sixth Annual Computer Chess Championship Tournament, a student program on Oct. 21, a computer arts display and a publishers' book fair of current offerings in the field.

Also, a two-day graphics seminar will be conducted prior to the conference on Oct. 18-19 to

Societies/ User Groups

provide a broad introduction to the fundamentals of computer graphics.

For further information on the conference, contact ACM Headquarters, 1133 Avenue of the Americas, New York 10036.

Fadpug Elects New Officers

WASHINGTON, D.C. — The Federal ADP Users Group (Fadpug) has recently elected a slate of officers for two-year terms of office beginning July 1. The new president is Paul D. Oyer of the U.S. Census Bureau.

Fadpug's purpose is to improve the management and use of the Federal Government's ADP resources with a view toward optimizing the effectiveness of government operations. Activities focus on the sharing and exchange of ideas and techniques, promoting professional development of personnel, developing better communication between DP installations and clarifying DP policies and guidelines.

Membership is open to any Federal Government employee. For further information, contact Fadpug, Room 1133, South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

IEEE/CS Offers Index Update

LONG BEACH, Calif. — The first cumulative index to the IEEE Computer Society Repository may now be ordered. Covering holdings from 1966 through 1973, the 135-page volume contains an author and subject index of just under 1,600 papers, reports and documents.

The repository is a collection of technical papers and documents relating to computer science and engineering that is operated by the Computer Society as a service to the information processing community. There are about 300 entries per year and updates to the index are planned at appropriate intervals.

The index is priced at \$12 for society members, \$16 for non-members. Copies may be ordered from the IEEE Computer Society Publications Office, 5855 Naples Plaza, Suite 301, Long Beach, Calif. 90803.

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Westin to Keynote ACM '75 Meeting

MINNEAPOLIS — "Computers and the Quality of Life" is the theme of ACM '75, the annual conference of the Association for Computing Machinery. The conference is scheduled here for Oct. 20-22.

Dr. Alan F. Westin will open the conference with a keynote speech addressing "The Next Decade of the Computer Revolution: Privacy, Participation and Power." Westin is currently professor of public law and government at Columbia University and served as a consultant to the Senate Committee on Govern-

ment Operations, which drafted the Senate bill that ultimately was enacted as the Federal Privacy Act of 1974.

The conference's technical program will emphasize panel and tutorial sessions considered of general interest to most ACM members.

The program will consist of 60 sessions, including three on microprocessors; four on computer networks; two on data structures and computational practice in mathematical programming; a debate on high-level languages; a panel on memory

management and operating systems; a variety of tutorials, including a demonstration of four symbol-manipulation systems; and several sessions devoted to software management and documentation.

Special Features

Special features of the conference include the Sixth Annual Computer Chess Championship Tournament, a student program on Oct. 21, a computer arts display and a publishers' book fair of current offerings in the field.

Also, a two-day graphics seminar will be conducted prior to the conference on Oct. 18-19 to

Societies/ User Groups

provide a broad introduction to the fundamentals of computer graphics.

For further information on the conference, contact ACM Headquarters, 1133 Avenue of the Americas, New York 10036.

Fadpug Elects New Officers

WASHINGTON, D.C. — The Federal ADP Users Group (Fadpug) has recently elected a slate of officers for two-year terms of office beginning July 1. The new president is Paul D. Oyer of the U.S. Census Bureau.

Fadpug's purpose is to improve the management and use of the Federal Government's ADP resources with a view toward optimizing the effectiveness of government operations. Activities focus on the sharing and exchange of ideas and techniques, promoting professional development of personnel, developing better communication between DP installations and clarifying DP policies and guidelines.

Membership is open to any Federal Government employee. For further information, contact Fadpug, Room 1133, South Building, U.S. Department of Agriculture, Washington, D.C. 20250.

IEEE/CS Offers Index Update

LONG BEACH, Calif. — The first cumulative index to the IEEE Computer Society Repository may now be ordered. Covering holdings from 1966 through 1973, the 135-page volume contains an author and subject index of just under 1,600 papers, reports and documents.

The repository is a collection of technical papers and documents relating to computer science and engineering that is operated by the Computer Society as a service to the information processing community. There are about 300 entries per year and updates to the index are planned at appropriate intervals.

The index is priced at \$12 for society members, \$16 for non-members. Copies may be ordered from the IEEE Computer Society Publications Office, 5855 Naples Plaza, Suite 301, Long Beach, Calif. 90803.

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Calendar

Sept. 11-12, Boston — 1975 Eastern Regional Operations and Automation Workshop, sponsored by the American Bankers Association. Contact: ABA, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Sept. 14-19, Las Vegas — International Conference on Environmental Sensing and Assessment, sponsored by the Institute of Electrical and Electronics Engineers, Inc. Contact: IEEE-TAB, 345 E. 47 St., New York, N.Y. 10017.

Sept. 17-19, Washington, D.C. — 1975 Mumps Users Group Meeting. Contact: Dr. Joan Zimmerman, Mumps Users Group, Biomedical Computer Laboratory, 700 South Euclid Ave., St. Louis, Mo. 63110.

Sept. 21-25, Washington, D.C. — International Symposium on Computer Assisted Cartography. Contact: Dorothy Bomberger, Symposium Secretariat, U.S. Bureau of the Census, Washington, D.C. 20233.

Sept. 22-24, Chicago — Fifth International Symposium and Exposition on Industrial Robots. Contact: Edward P. Fahy, IIT Research Institute, 10 West 35th St., Chicago, 60616.

Sept. 23-25, London — Eurocomp, the European Computing Congress. Contact: Christine Amon, Online Conferences Ltd., Brunel University, Uxbridge Middlesex, England.

Sept. 29-Oct. 1, Toronto — International Electrical, Electronics Conference and Exposition. Contact: 1450 Don Mills Road, Don Mills, Ontario, M3B 2X7, Canada.

Oct. 1-3, Itasca, Ill. — 5th Annual Association of Computer Programmers and Analysts (Acpa) National Conference. Contact: Acpa-V Conference Headquarters, P.O. Box 2349, Chicago, 60690.

Oct. 1-3, London — Datafair '75, the British Computer Society's sixth biennial computer conference. Contact: Terence Carville, Infoplan Ltd., 20 Eastbourne Terrace, London W2 6LN.

Oct. 4-8, New York — Centennial Convention of the American Bankers Association. Contact: Convention/Meeting Services Division, American Bankers Association, 1120 Connecticut Ave., N.W., Washington, D.C. 20036.

Oct. 7, Los Angeles — 1975 Western Systems Conference, sponsored by the Association for Systems Management. Contact: John P. Lane, Lloyd's Bank California, 548 S. Spring St., Los Angeles, 90013.

Oct. 7-8, Washington, D.C. — 9th Annual Instrumentation and Computer Fair. Contact: Robert Harar, Instrumenta-

tion Fair, Inc., 5012 Herzel Place, Beltsville, Md. 20705.

Oct. 12-15, Toronto — 20th Annual Conference of the Association of Records Managers and Administrators (Arma). Contact: Gerald L. Hegel, Tab Products Co., 617 Vine St., Suite 1309, Cincinnati, 45202.

Oct. 13-16, Boston — Univac Users Association Fall Conference. Contact: B.J. Frable, Sperry Univac Division, Sperry Rand Corp., P.O. Box 500, Blue Bell, Pa. 19422.

Oct. 13-17, Atlanta — 37th Annual Meeting of the American Society for Information Sciences (Asis). Contact: Dr. V. Slamecka,

Societies/ User Groups

School of Information and Computer Science, Georgia Institute of Technology, Atlanta, 30332.

Oct. 14-16, Lausanne, Switzerland — 1975 International Conference on Advanced Signal Processing Technology. Contact: Secretariat of "Journées d'Electronique," Ch. de Bellerive 16, 1007 Lausanne, Switzerland.

Oct. 14-16, Brussels — Second International Symposium on Camac in Computer Applications. Contact: Organizing Committee 2nd Camac Symposium, De. H. Meyer, c/o Commission of the European Communities, C.R.C.-CBNM, Steeweg naar Retie, B-2440 Geel (Belgium).

Oct. 15-17, Chicago — 13th Annual Government-Industry Data Exchange Program Workshop. Contact: John W. Reed, Raytheon Co., Dept. 7362, 350 Lowell St., Andover, Mass. 01810.

Oct. 19-24, Kansas City, Mo. — Computer Systems in Law Enforcement Workshop. Contact: Betty B. Bosarge, Professional Standards Division, International Association of Chiefs of Police, Eleven Firstfield Road, Gaithersburg, Md.

Oct. 20-22, Minneapolis — ACM '75, the annual conference of the Association for Computing Machinery. Contact: ACM '75, P.O. Box 658, Hopkins, Minn. 55343.

Oct. 22-24, Cleveland — Computer Management Association and Honeywell Users Group Joint Users Conference. Contact: John Smalling, Oglebay Norton Co., The Hanna Building, 1422 Euclid Ave., Cleveland, 44115.

Oct. 26-29, Atlanta — Bank Administration Institute's 51st National Convention. Contact: BAI, P.O. Box 55, 303 S. Northwest Highway, Park Ridge, Ill. 60068.

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CI Notes

GAO OKs Line of Business

WASHINGTON, D.C. — The General Accounting Office (GAO) has given the Federal Trade Commission (FTC) approval to send out the 1974 forms for line-of-business accounting to over 400 large manufacturing firms.

The matter was held up pending GAO's satisfaction that the FTC had taken steps to simplify the questionnaire, reduce the cost of complying with the program and to ensure the information was not being sought from other government agencies.

Over 100 companies are fighting the measure, among them IBM. The Armonk firm filed a joint complaint with R.J. Reynolds Co. in District Court, Southern District of N.Y. in February.

The complaint alleged the FTC lacks the authority to require line-of-business reporting and asked the court to rule the procedure violates the constitution. In addition, the complaint sought an injunction to bar the release of any information obtained from these reports.

Under the program, firms are asked to disclose their sales and profits by each line of business rather than company-wide.

Calcomp Moving ATL to California

ANAHEIM, Calif. — California Computer Products, Inc. (Calcomp) is moving its Automated Tape Library (ATL) engineering and manufacturing operations to Anaheim from its Boulder, Colo., facility.

The move "will result in considerable facility cost savings," according to Lester L. Kilpatrick, Calcomp president, who added he does not expect the move to cause any significant delay in delivery of ATL systems.

The move is scheduled to be completed by Sept. 30.

Burroughs Nets Aussie Order

CANBERRA, Australia — Burroughs Corp. has received an order for a large B7700 from the Australian Public Service Board.

The system, valued at \$5 million, will be linked with terminals throughout the country to provide access to records on personnel and organizations.

The departments of public service in personnel and organization control will be the users of the system, as well as the Australian Treasury and Retirement Benefits Office.

Supershorts

Uppster Corp. has signed Idac S.A. as distributor in France.

Inforex has shipped over 2,000 key-to-disk systems overseas.

Analysts Say

DP Stocks Follow Others in Summer Drop

By Nancy French
Of the CW Staff

Financial analysts who watched computer systems stocks begin to climb sharply in late June, peak during the week of July 11 and plummet a week later agreed the computer stocks have followed the basic pattern set by the rest of the market.

There, typified by the Dow Jones Industrials, stock prices dropped sharply, with selling triggered by continuing recession, threats of higher energy prices and inflation.

Computerworld's index of computer systems stocks showed a climb from 102 on June 19 to nearly 120 on July 17. As of August 21, it had hit 94.

Analysts disagreed on the subject of performance. Bernard Dorshow, a computer specialist with Lehman Brothers and Harry Edelson, a senior analyst at Drexel Burnham & Co. said the computer stocks were even underperforming the market.

Bob Golden, an analyst with Shearson Hayden Stone, Inc., disagreed, saying the rest of the stock market is doing equally poorly.

"And within the computer framework, there are some divergences, in that IBM is down rather sharply in spite of its good performance, whereas some of the other stocks which are in worse shape on a performance basis or not down enough," he said.

However, there was no disagreement over the effect of Xerox's decision to leave the mainframe business. All said it "may have caused an initial flurry of selling," and Golden added the demise of Xerox Corp.'s Data Systems Division may have "raised questions about the disappearance of still another of IBM's competitors," providing more grist for the Justice Department's antitrust suit against IBM.

However, the announcement had little effect on buyers and sellers of stock.

"If it had, everybody would be buying IBM now, and they're not," Edelson pointed out.

On an immediate basis, the Xerox announcement may have affected the price of a few stocks of companies about which many people are already asking questions, such as Honeywell and Control Data Corp., Golden said.

Both Golden and Dorshow agreed, however, that, had a similar decision been announced by Control Data Corp. Honeywell or Univac, for example, the impact would have been considerable.

"The basic principle we see acting here is typical of a down market," Golden said. If there's any question at all about the quality of a stock, its price will drop

during a down period, and that principle could be applied to almost every computer company, including IBM, he said.

Both Dorshow and Edelson linked two other factors to the general downturn of the computer stocks:

The worldwide recession, which has affected the multinationals with special severity, and the theory that computer stocks in general tend to rise and fall with the fortunes of IBM.

"And a number of factors have affected IBM's fortunes this year," Edelson contended.

First, he cited the Justice Department's antitrust suit against IBM and, second, the company's relatively lackluster earnings, which are considered typical performance during the winddown of a product cycle — in this case, the System 370.

Secondly, Edelson noted the Employee Retirement Income Security Act — a pension law passed this year — which asks fund managers to keep stock volumes at "prudent" levels.

Other fund managers have come under

Congressional criticism for overemphasizing the upper tier of "favored-50 stocks" in building their portfolios to the exclusion of the rest of the market, Golden said.

Banks and funds have become sensitive to this criticism and, as a result have sold large blocks of IBM, eroding the price and bringing about a considerable redistribution of the stock, Edelson explained.

Edelson, however, sees this circumstance as "bullish" for IBM, and, therefore, "bullish" for the computer stocks in general.

"I think they are forming the base here for IBM. If banks, insurance companies and funds had kept their holdings of IBM, I wouldn't have thought so, but because many have cut back from, say, 10% of their portfolios consisting of IBM to, say, only 5%, they can buy in again without being 'imprudent.'"

This redistribution process will probably end "very soon," Edelson predicted, and IBM will again sell on the fundamentals.

(Continued on Page 66)

Caravan '76 Planning to Visit Same Nine Cities as in 1972

NEWTON, Mass. — The '76 Computer Caravan is preparing to roll on a nine-city tour that will stop at the same cities as the original Caravan in 1972.

Included on the tour are four cities the Caravan did not visit last year: Boston, Detroit, Dallas and Washington, D.C.

Starting in Boston March 2, the exhibit, sponsored by Computerworld, Inc., will proceed to the N.Y. Coliseum March 9-11, then on to the Sheraton Park Hotel in Washington March 16-18.

March 23-25 the Caravan will be at the Atlanta Merchandise Mart, and on to Detroit's Cobo Hall March 30-April 1.

After a break week, the show appears in Chicago at McCormick Place and then heads south to the Dallas Market Center April 20-22.

The West Coast stops are at Los Angeles' Convention Center May 4-6 and San Francisco's Civic Auditorium May 11-13.

Attendance is expected to increase by about 10%, putting the number over 35,000, said Avery Blake, president of The Conference Company, a division of Computerworld, Inc. that manages the Caravan.

Last year there were about 60 exhibitors, he added.

The 1976 Caravan offers several new packages in addition to the nine-city tour. Exhibitors can sign up for regional tours

featuring four cities on the East Coast, two on the West Coast or three in the Midwest, as well as the major city tour of New York, Chicago and Los Angeles. In addition, he said, exhibitors can add on specified cities to whatever package they choose.

In addition, the Data Comm '76 add-on option allows exhibitors interested in both markets to take advantage of the economical turnkey approach of the Caravan and apply it to Data Comm '76, Blake said.

This feature enables exhibitors to add the Data Comm '76 exhibit in New Orleans Feb. 16-18 at the Rivergate Convention Center to their Caravan schedule.

There is a definite trend, in that previous exhibitors are increasing their booth commitments, Blake added.

Forum Topics

A new group of topics has been selected for the three-day series of user-oriented forums held in conjunction with the exhibits.

The topics include management overview on the first day, software on the second day and computer networks on the final day.

There are four concurrent workshops conducted by users each day. These will be repeated twice in the mornings so attendees can listen to a variety of topics.

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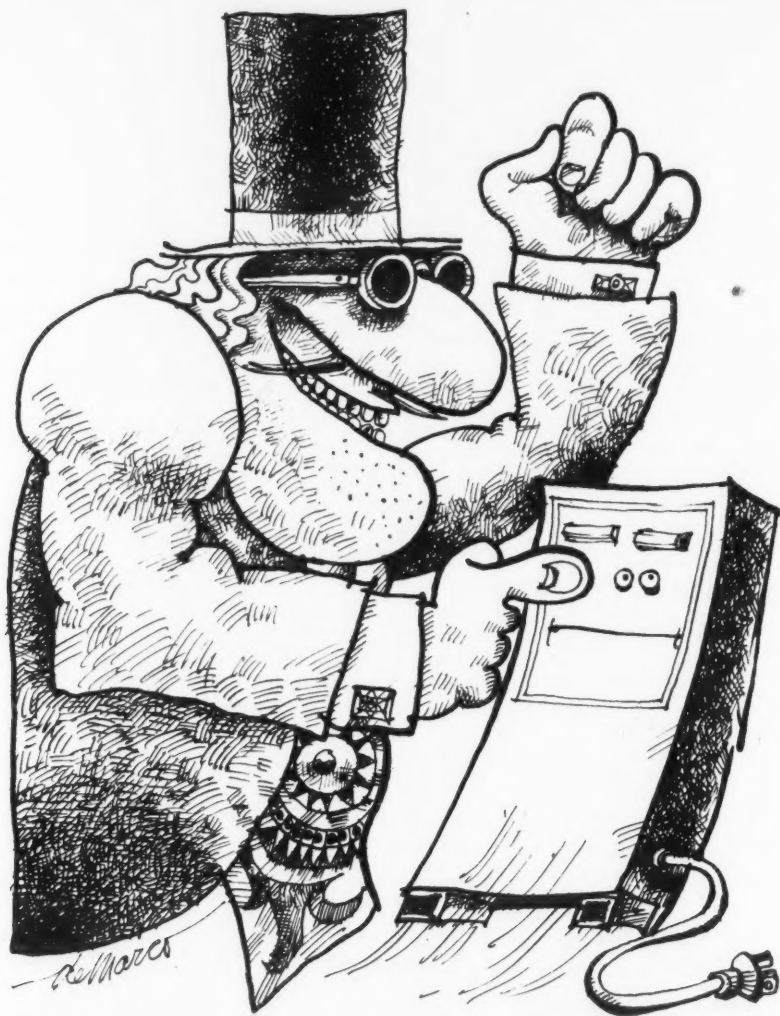
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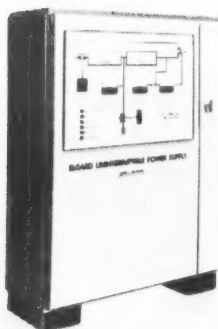
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GA Reorganizes in Wake Of Management Changes

ANAHEIM, Calif. — In the wake of the management shuffle at General Automation Inc. (GA), five functional profit and loss groups have been formed including customer service, products, systems and international and subsidiary groups as well as a domestic sales division.

Chairman Lawrence A. Goshorn, who has stepped into the additional roles of president and vice-president following the resignations of Raymond Noorda and Michael Ford respectively [CW, Aug. 27], made the announcement.

A Systems Group has been formed under the direction of group executive George Vosatka, who is in charge of all industrial, communications and data management system marketing, development and manufacturing.

W. Joseph Watson, vice-president of the Products Group, has additional responsibility for marketing and manufacturing of all computer and peripheral products.

All international activities, including the European, Far Eastern and International Dis-

tributors Division, have been consolidated into the International Group under the direction of Goshorn.

Jay L. Kear continues as vice-president of sales with responsibility for the Domestic Sales Division.

Richard P. Carroll retains responsibility for all field service, training and technical publications as vice-president of the Customer Service Group.

"All of the organizational changes are in accordance with our continuing plans to structure the company to provide strong financial control over our various lines of business," Goshorn explained.

Qume Gets Financing

HAYWARD, Calif. — Qume Corp. is planning to increase production of its printers after completing \$1.2 million in additional financing.

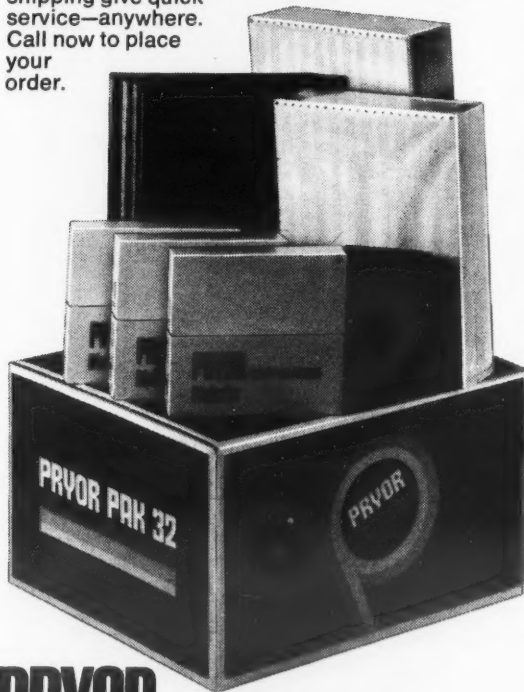
Qume currently ships over 450 printers a month, the firm said.

The financing includes \$680,000 in equity from private investors and a \$500,000 addition to a \$2 million line of credit with First Pennsylvania Bank.

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Remex Catering to Smaller OEMs for Floppy Business

By Molly Upton
Of the CW Staff

SANTA ANA, Calif. — Remex is carving a niche in the floppy drive business by catering to the smaller OEM customer who needs electronics and interface designs as well as the drive mechanism, according to Bill Walker, the company's director of marketing.

"We're probably one of the few drive makers looking at the total system all the way back to the software," Walker said.

Often, he explained, "the OEM knows he wants a floppy, but doesn't know how to apply it." Remex designs the formatter and helps the customer decide which functions of the controller to put in hardware and software.

One customer, for example, has the double-density feature controlled by the formatter in the drive. The rest of the controller is on a printed circuit board placed in his computer. The customer supplies the power supply and will write the driver,

DP Stocks Join Others in Drop

(Continued from Page 63)

One thesis holds that the IBM product cycle is much like an inverted V, or the Greek letter lambda, Edelson said. At present, the end of the 370 cycle has placed the stock on the downward leg of the lambda. Both revenues and earnings have slowed. This, combined with heavy selling by the institutions, has kept prices down, he said.

Although the Future Systems terminology has been scrapped, IBM Chairman Frank T. Cary recently said in *Barrons* that this action in no way precludes introduction of an intermediate-level new product, Edelson said. The "new, more sophisticated peripherals demand it," Edelson added.

Dorshow said another factor contributing to IBM's lackluster earnings this year was last year's unusually large number of 370/158 and 168 purchases.

Another analyst, whose clients are principally individuals, agreed with Golden's contention that all computer stocks have not performed uniformly.

"Minis are where all the action and excitement is today — it's a very volatile area. They over-swing up and overswing down. Both Digital Equipment Corp. and Data General Corp. have done well," he said, "although a lot of other mini stocks have not been able to survive the recession too well, and are heavily depressed."

"Their stocks have reacted to earnings performance," he said.

"Some are concerned that growth has slowed in the main-frame area, and people are hesitating to buy. People are almost totally afraid of peripheral companies," he added.

"What's more, interest in technology is temporarily waning," he remarked.

"The street always gets very hung up on one thing at a time, and right now that thing is basic industries such as chemicals and steel."

Walker said.

Eventually, Walker expects many of these customers to take the electronics in-house, but "they'll buy several hundred before that."

"If we can supply the OEM with 300 to 500 drives with electronics on the front end, we can do it," Walker said, explaining Remex "has most of the building blocks; we just repackage."

Within the floppy disk industry, drive manufacturers generally concentrate on supplying

hardware, he said, and the systems houses are principally oriented toward creating turnkey systems for the end user, "but no one is concentrating on what the smaller OEM needs."

End-User Sales

Remex is also selling a floppy disk drive and electronics to the end user, which is one of its first forays into the end-user market, Walker said.

The firm has interfaces for the Digital Equipment Corp. PDP-11 and Data General Nova and will

have one for the DEC PDP-8/E. The software for the PDP-11, called ROS-11, supports other peripherals on the 11, he said.

In keeping with Remex's more traditional line of supplying paper tape punches, many of which are used in numerical control, Remex is working with an OEM customer to design a floppy for use in "dirty environments."

The heat level is higher at such sites because the units are enclosed to keep out the dirt.

The principal problem seems to

be the media, Walker said, but Remex is working closely with one of the manufacturers and a new jacket has been designed. Some of the units are being field-tested and are performing well, he said.

Remex began its entry into the floppy business with a marketing agreement with Orbis. The agreement also included manufacturing rights to Orbis' Model 74B drive, Walker explained.

Remex chose to obtain a license rather than design its own units because of expediency.



Merger Meets Snags

PARIS — The proposed merger of Compagnie Internationale de l'Informatique (CII) and Honeywell Bull has run into some snags arising from certain clauses in the contract.

Although the agreement calls for Honeywell Information Systems (HIS) to control 47% of the newly merged entity, one clause provided that whichever company has the larger revenues would control decisions on world research and development operations.

By consolidating its Canadian and British revenues, Honeywell would have the larger share, an article in *The Financial Times* of London pointed out.

The agreement called for Thomson CSF to take over CII's Toulouse, France plant and its military, space and minicomputer operations.

But a clause would effectively prohibit Thomson from competing with CII-Honeywell Bull in these fields for at least 15 years, the article said.

According to Entrex Head

Source Data Processing on Rise

By Molly Upton
Of the CW Staff

NEWTON, Mass. — Source data processing is one of the faster growing areas in the data entry field, said Entrex, Inc. President Donald W. Feddersen.

"More and more users today are doing all possible DP before that data reaches the mainframe," explained W. Harry Vickers, vice-president of market development and support.

Entrex plans to broaden the scope of its market, he said, and a product announcement is scheduled for the first of the year, concerning either intelligent terminals or a data base management system.

Currently, Entrex terminals can be used in both the cluster environment with a shared processor and in remote user departments, linked to the Entrex processor either by hard wire or

communications, he explained. Entrex emphasizes thinking of data entry as an integral part of DP in a customer's operations, said Vickers.

"People think mainframes, and they don't quite understand the cost involved in data entry," he said. "For instance, some have gone on-line to IBM's Customer Information Control System," which he characterized as a very expensive method not geared to handling real volume applications.

Entrex markets its systems to the central DP department, he explained, rather than to the divisions, as is the practice with several intelligent terminal makers, Vickers said.

With the trend in the market toward the sophisticated, upper-level product, users are finding they can reduce central processor time by preprocessing in the Entrex units, he said.

Some users have found they are able to put a lot more applications on the upper-end Entrex systems, which have a Digital Computer Controls, Inc. minicomputer. In fact, Entrex performs bill-of-materials processing on its in-house system, Feddersen said.

Data Entry-Oriented

But, instead of marketing the Entrex units as small business machines, which would be getting a bit close to marketing vs. IBM, Entrex continues to tout its products as data entry-oriented devices.

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Although the shared processor data entry market is leveling off, Entrex is still growing, he noted.

Domestic Orders Up

The domestic order rate was up 86% in the first six months of 1975 compared with the same 1974 period. "We were not entirely happy with the first quarter's results, but the second quarter was up 30% over the first quarter of 1975," he said.

Rental and service revenue was up 108% in the first half of 1975, he added.

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The Entrex line is software-compatible, he added.

Entrex had virtual capability in its products as early as 1972, but it wasn't until 1973 or 1974 that it figured what to call that capability, Vickers said.

\$969.*

**Get an ASR terminal from us for less than
a KSR terminal from someone else.**

Compared to our competitors' KSR terminals, the Teletype* model 33 ASR's price is unbelievably low.

For example, our \$969 ASR includes as standard many of the features others charge extra for. Features like paper-tape reader and punch, answer-back, even-parity generation, automatic carriage return and line-feed (if you need it), as well as a pedestal.

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If you think our \$969 price tag is rock bottom, you're wrong. We've got KSR's for as little as \$693* and RO's starting at \$584*. So whatever your mini-computer operation, don't pay a maxi-price for a data terminal.

Service? As much or as little as you need. You tell us and we'll come up with a plan that suits you to a T. No matter where you are. Or what you need.

But when you come right down to it, you won't need much service. Because the model 33 is one of the most dependable terminals in the industry.

We set all the standards. And we live up to our name.

The model 33. It's what you need. At a price no one can touch.

For more information, write or call: TERMINAL CENTRAL, Teletype Corporation, 5555 Touhy Ave., Skokie, Ill. 60076 (312) 982-2000.



Remex Catering to Smaller OEMs for Floppy Business

By Molly Upton
Of the CW Staff

SANTA ANA, Calif. — Remex is carving a niche in the floppy drive business by catering to the smaller OEM customer who needs electronics and interface designs as well as the drive mechanism, according to Bill Walker, the company's director of marketing.

"We're probably one of the few drive makers looking at the total system all the way back to the software," Walker said.

Often, he explained, "the OEM knows he wants a floppy, but doesn't know how to apply it." Remex designs the formatter and helps the customer decide which functions of the controller to put in hardware and software.

One customer, for example, has the double-density feature controlled by the formatter in the drive. The rest of the controller is on a printed circuit board placed in his computer. The customer supplies the power supply and will write the driver.

DP Stocks Join Others in Drop

(Continued from Page 63)

One thesis holds that the IBM product cycle is much like an inverted V, or the Greek letter lambda, Edelson said. At present, the end of the 370 cycle has placed the stock on the downward leg of the lambda. Both revenues and earnings have slowed. This, combined with heavy selling by the institutions, has kept prices down, he said.

Although the Future Systems terminology has been scrapped, IBM Chairman Frank T. Cary recently said in *Barron's* that this action in no way precludes introduction of an intermediate-level new product, Edelson said. The "new, more sophisticated peripherals demand it," Edelson added.

Dorshow said another factor contributing to IBM's lackluster earnings this year was last year's unusually large number of 370/158 and 168 purchases.

Another analyst, whose clients are principally individuals, agreed with Golden's contention that all computer stocks have not performed uniformly.

"Minis are where all the action and excitement is today — it's a very volatile area. They over-swing up and over-swing down. Both Digital Equipment Corp. and Data General Corp. have done well," he said, "although a lot of other mini stocks have not been able to survive the recession too well, and are heavily depressed."

"Their stocks have reacted to earnings performance," he said.

"Some are concerned that growth has slowed in the main-frame area, and people are hesitating to buy. People are almost totally afraid of peripheral companies," he added.

"What's more, interest in technology is temporarily waning," he remarked.

"The street always gets very hung up on one thing at a time, and right now that thing is basic industries such as chemicals and steel."

Walker said.

Eventually, Walker expects many of these customers to take the electronics in-house, but "they'll buy several hundred before that."

"If we can supply the OEM with 300 to 500 drives with electronics on the front end, we can do it," Walker said, explaining Remex "has most of the building blocks; we just repackage."

Within the floppy disk industry, drive manufacturers generally concentrate on supplying

hardware, he said, and the systems houses are principally oriented toward creating turnkey systems for the end user, "but no one is concentrating on what the smaller OEM needs."

End-User Sales

Remex is also selling a floppy disk drive and electronics to the end user, which is one of its first forays into the end-user market, Walker said.

The firm has interfaces for the Digital Equipment Corp. PDP-11 and Data General Nova and will

have one for the DEC PDP-8/E. The software for the PDP-11, called ROS-11, supports other peripherals on the 11, he said.

In keeping with Remex's more traditional line of supplying paper tape punches, many of which are used in numerical control, Remex is working with an OEM customer to design a floppy for use in "dirty environments."

The heat level is higher at such sites because the units are enclosed to keep out the dirt.

The principal problem seems to

be the media, Walker said, but Remex is working closely with one of the manufacturers and a new jacket has been designed. Some of the units are being field-tested and are performing well, he said.

Remex began its entry into the floppy business with a marketing agreement with Orbis. The agreement also included manufacturing rights to Orbis' Model 74B drive, Walker explained.

Remex chose to obtain a license rather than design its own units because of expediency.



Merger Meets Snags

PARIS — The proposed merger of Compagnie Internationale de l'Informatique (CII) and Honeywell Bull has run into some snags arising from certain clauses in the contract.

Although the agreement calls for Honeywell Information Systems (HIS) to control 47% of the newly merged entity, one clause provided that whichever company has the larger revenues would control decisions on world research and development operations.

By consolidating its Canadian and British revenues, Honeywell would have the larger share, an article in *The Financial Times* of London pointed out.

The agreement called for Thomson CSF to take over CII's Toulouse, France plant and its military, space and minicomputer operations.

But a clause would effectively prohibit Thomson from competing with CII-Honeywell Bull in these fields for at least 15 years, the article said.

According to Entrex Head

Source Data Processing on Rise

By Molly Upton
Of the CW Staff

NEWTON, Mass. — Source data processing is one of the faster growing areas in the data entry field, said Entrex, Inc. President Donald W. Feddersen.

"More and more users today are doing all possible DP before that data reaches the mainframe," explained W. Harry Vickers, vice-president of market development and support.

Entrex plans to broaden the scope of its market, he said, and a product announcement is scheduled for the first of the year, concerning either intelligent terminals or a data base management system.

Currently, Entrex terminals can be used in both the cluster environment with a shared processor and in remote user departments, linked to the Entrex processor either by hard wire or

communications, he explained.

Entrex emphasizes thinking of data entry as an integral part of DP in a customer's operations, said Vickers.

"People think mainframes, and they don't quite understand the cost involved in data entry," he said. "For instance, some have gone on-line to IBM's Customer Information Control System," which he characterized as a very expensive method not geared to handling real volume applications.

Entrex markets its systems to the central DP department, he explained, rather than to the divisions, as is the practice with several intelligent terminal makers, Vickers said.

With the trend in the market toward the sophisticated, upper-level product, users are finding they can reduce central processor time by preprocessing in the Entrex units, he said.

Some users have found they are able to put a lot more applications on the upper-end Entrex systems, which have a Digital Computer Controls, Inc. minicomputer. In fact, Entrex performs bill-of-materials processing on its in-house system, Feddersen said.

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Category	Al	Bob	Carl	Dave	Ed
1-How Became Manager	Political	Technical Ability	Technical and Management	Political	Management Quality
2-Personality	Terse	Insecure	Cordial	Friendly	Semi-Formal
3-Role in Production	Method-Oriented	Do It Myself	Production Oriented	Protect Myself	Results-Oriented
4-Upward/Downward Directed	Up	Up	Down	Up	Both
5-Production Tactics	Threats	Foremanism	Motivate	Hope for Best	By the Book
6-Loss of Employees	Very High	Fairly High	Minimal	Above Average	Minimal
7-Planning Strategy	Make and Enforce Schedule	Strict Schedule Enforcement	Participative	Somewhat Blue Sky	Much Planning, Timely Checks

Composite Management Categories

View From Below Shows Manager Should Leave His Quirks Home

By Robert Powers

Special to Computerworld

Although the youth of the DP industry has made it easier to incorporate new concepts in marketing and manufacturing than in older industries, there is still a tremendous need and opportunity for management training.

Within our grasp is the ability to pole vault over the present state of the art in DP. However, it doesn't seem likely that we will be able to do it in our present state of unprepared management.

According to composite management profiles drawn up from 50 first- and second-level managers in about 14 nationally known companies, 60% of front-line management requires some degree of retraining.

We can do better than this.

The management profiles, drawn from both hardware and software fields, fell fairly evenly into five composite characterizations of Al, Bob, Carl, Dave and Ed (see the chart at the left).

They are judged not on neatness, clarity and aptness of thought, but on matters considered to be important to the people who work for them.

In category one, attainment of the position itself, the Als and Daves reached management through political means — some through power plays, others selected from above with the hope of an unhesitating yes vote whenever required.

Bob is a classic example of promoting the most technically competent person as a result of reorganization or an unexpectedly large expansion. Unfortunately, two voids are created in the single move. Not only is the best source of technical expertise lost to that capacity, but a manager is created who must look up the word in the dictionary.

Carl, having both technical and managerial training, is a good and obvious choice. Even if there is need for him to train a technically competent replacement, there is time because the managerial skills are already present, providing the freedom to do so.

Ed is a strange bird. Competent in managerial abilities, but in touch only with the physical work at hand in a more academic sense, he must employ higher level management techniques in his lower level position.

Healthy Work Environment

At category two, personality, Carl and Ed treat the people working for them with professional courtesy and respect — a great psychological asset for them, creating a healthy working environment.

Dave carries around an "I'm one of the guys" sign, giving off an aura of not quite being ready for a leadership position.

Bob feels even less secure in a leadership role, but John Wayne would be proud of the way he conceals it.

Al doesn't have much time for his people socially. A sort of class consciousness permeates the "I'm always right" attitude of this personality.

Category three is the attitude with which these leaders view their part in the job at hand.

Both the Als and the Bobs are unable to delegate authority, but for different reasons. Al wants assurance things will be done his way, for fear of loss of power.

Bob, however, is forever convinced that no one can do the job better than he.

While both slow the job with this policy, Bob does more damage because he needs to be involved in more minute detail.

Dave has an unhealthy concept of his role in production. Concerned more with his reputation than his responsibilities, he jeopardizes both.

Carl and Ed are somewhat alike here. Both believe they and their troops have a mutual goal of finally popping whatever is under development out of the far end of the assembly line.

Ed, however, has an additional goal — to pop "Production 1" out at such a time and in such a way that the home office will remark, "Isn't Ed one hell of a guy?"

Category four is a matter of to whom the manager feels responsible. Al, Bob and Dave take the most popular choice of the buttered side of the bread.

The interest is not just to deliver upstairs the product made in the basement but, more importantly to these three, to measure the oval office for size — their size.

Carl considers himself as representative of his workers and Ed feels a sense of responsibility to both his own management and his work force for various reasons.

(Continued on Page 69)



This time the plug is attached to our sensational new low-cost Printer. Instantly plug-to-plug compatible with your IBM Controller.

Last year it was our G77 plug-in Display Terminal that won all those rave notices. Thanks to its outstanding price-performance advantages, users everywhere called it the ultimate alternative to IBM.

This year we're proud to present the Display Terminal's remarkable new plug-in companion.

The GENESIS ONE® G-Series Printer.

Like the Display Terminal, our new Printer connects directly to IBM's 3271/3272 Model 2 Control Units. No changes required in software or connecting hardware. Just plug ours into theirs and push "Start."

The G-Series Printer is the new interchangeable replacement for IBM's 3284, 3286 or 3288 Printers. But any other comparison stops right there!

Speed? No Contest. Our Printer is available with speeds of 88, 120 or 165 characters per second. Model for model, lots faster than IBM.

Vertical Forms Control. A separate vertical tabulation channel is standard on all our models. Not just the most expensive one.

Adjustable Sprocket Feed. It means there are no platens to change when you change the width of the paper.

Many Additional Features. Automatic motor control. Audible alarm. 9X7 dot-matrix characters. Advantageous purchase/rental pricing program. Famous SORBUS nationwide maintenance network.

All in all, a price-performance ratio far more attractive than IBM.

GENESIS ONE Computer Corporation is an MAI Company whose clients include over 300 of the Fortune 500 Companies. A lot of tough-minded, cost-conscious customers who have proved to themselves that we are the alternative to IBM.

Plug into our G-Series Printer and prove it to yourself.

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COMPUTER CORPORATION

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Gentlemen: I agree it makes sense to consider the alternative. Send me complete information on your G-Series Printer.

Give me a call _____ Phone Number _____

Name _____

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City _____ State _____ ZIP _____

And now another terrific plug for IBM!

After Year-Long Bid Evaluation

Univac Lands \$14.5 Million Contract From L.A. County

LOS ANGELES — Univac has landed an order for systems valued at about \$14.5 million from the County of Los Angeles.

The award came after a year-long evaluation of bids submitted by 17 computer and peripheral equipment manufacturers. Evaluations were performed by three independent consultants and 11 organizations from the county, state and federal governments.

Two Univac 1110 multiprocessors in a two-by-two configuration will be installed in the Welfare and General Government computer centers along with line printers, tape and disk drives and communications controllers.

The CPUs are scheduled for installation in October and mid-1976. Eligibility determination, one of the initial applications to go on-line in the Welfare Computer Center, is scheduled to be operational next May.

The General Government conversion is scheduled to be completed by November 1976.

One 1110 CPU will monitor and control nearly 1.5 million active individuals on Welfare and provide information, when needed, on about three million other individuals.

The system will also print purchase authorizations for food stamps, issue Welfare warrants and automate many procedures for determining the eligibility of

applicants.

When the communications network is completed next spring, the computer will be accessed by 562 Uniscope terminals located in 62 neighborhood Welfare offices from Long Beach to the Mojave Desert.

Some of the departments to be serviced by the second 1110, which will be installed in the county's General Government Computer Center, include auditor-controller, register recorder, assessor, tax collector, child support, purchasing and stores, chief administration officer, forester and fire warden and mechanical and personnel (for payroll).

The Transaction Interface Program will not only check passwords but the physical identifications of terminals to validate their access to the system, Univac said.

The Communications Management

System software will log each transaction as it enters the system in the event recovery is necessary.

Commenting on what is believed to be the largest civil government contract ever negotiated in the state of California, Los Angeles DP director Robert A. Best said, "More than 400 different evaluation criteria were applied in measuring the capabilities of the equipment and software proposed by the bidders.

"When all the tests were completed, we found Sperry Univac offered the most cost-effective total system solution to the county's Welfare and General Government needs."

"Being selected as the vendor for this major procurement, after an extremely thorough and objective analysis by the County of Los Angeles and the state and federal governments, is something we

prize very much," said C.R. Williams, vice-president and general manager of western operations for Univac.

The General Government computer center for the county currently uses Burroughs, Univac and IBM equipment to write payroll warrants and prepare the assessor's role, tax bills and other documents as well as process elections.

The Welfare Computer Center currently uses Honeywell equipment.

The 1110s will replace a Honeywell 3200, a Burroughs B3500, two Univac (RCA) Series 70/45 and one 70/35. They will also be taking some of the workload off an IBM 360/40, Univac said.

To give an idea of the workload, the county, with a 1974 population of 7.1 million people, accounts for about 34% of the total population of California and is larger than 41 of the 50 states.

DP Managers Should Leave Quirks Home

(Continued from Page 68)

Category five is the methodology employed. Al and Bob employ somewhat similar tactics as dictatorial foremen. While Bob's bark is loud and hollow, Al would not hesitate to fire employees, even for the sake of making an example.

Carl endeavors to motivate the work force individually and collectively, then give them the ball, confident of their ability.

Dave is all but inept in this area. Wishing has little to do with production, but the Daves will probably maintain their management positions for the same reasons they were given them.

Ed expects and usually receives work on time, taking it upon himself to remove what obstacles he can. Ed, however, takes a long time to recover when an unusual situation occurs.

Category six may be guessed at quite easily. Note the relationship between categories six and two.

Al, Bob and Dave lose a lot of employees, Carl and Ed very few. It should be pointed out that personality alone is not the only factor.

Some managers "encourage" several employees to leave when they can't be used to build "their kind of structure."

In work scheduling, those who will do the actual work schedule it in Carl's and Ed's groups. Carl's group also discusses the types and approaches to projects before final scheduling.

Dave's schedules are, at best, watery and unrealistic. Work is done toward unrealistic goals, however, so as not to inherit scapegoat status.

Al and Bob once again resort to authoritarianism. Each of the frequent status reports is considered a deadline. Often, in Al's group, the time duration scheduled for milestones is not even discussed with the employee.

We are an industry of highly skilled professionals. We are also human beings who require more from our efforts than money for groceries and house payments.

Better preparation for management would produce a more productive, innovative industry.

**If you're part of
what's happening in
data communications,
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DATACOMM 76**

**Announcing THE
data communications
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The Rivergate Convention Center,
New Orleans**

Orders & Installations

United Computing Systems, Inc. has ordered three models from Control Data Corp.'s Cyber 170 series, a 175 and two 174s, to be installed at its data center in Kansas City, Mo. The 175 will be delivered this year, the 174s in 1976.

North East Services Co., Inc. has installed a mid-range System 380 key-to-disk system from Entrex, Inc.

The Reader's Digest is replacing existing disk drives supplied by several vendors with a four-control unit, 16-drive complement of Ite 3330-compatible drives.

United Air Lines has ordered California Computer Products, Inc. 1030 disk controllers and 230 disk memories for use in its passenger reservations system.

Manufacturers Hanover Trust Co. has ordered 78 Sycor 250 intelligent display stations and 30 printers for use in its securities handling areas.

The Nutmeg Bakers Supply Co. of New Haven, Conn., is the first installation of IBM's System/32 Wholesale Food Distribution Accounting and Management System.

Tucson Data Center, Inc. has ordered a Burroughs B3700 to provide on-line DP services for 42 credit unions throughout Arizona.

Marine Midland Services Corp., the DP services arm of Marine Midland Bank, has ordered a 24K ICL 2903 computer system from International Computers Ltd. for use by its International Banking Division in New York.

The Long Beach, Calif., Community Hospital has ordered an HP3000 Model 300 CX computer system from Hewlett-Packard Co. to handle patient record-keeping and billing, personnel records and other administrative and medical tasks.

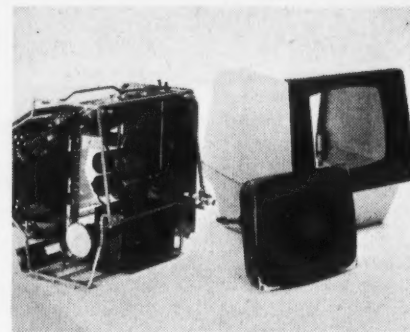
Wire CRT Chassis Gives Titchener High Hopes for Market Capture

BINGHAMTON, N.Y. — CRT manufacturers are finding they can save money, time and space by using welded wire chassis instead of solid metal enclosures.

Developed by the E.H. Titchener Co. here, the technique enables the electronics to be mounted on a custom-designed frame. A cabinet is then dropped over the frame.

The open wire frame ends heat problems and eliminates the need for cooling fans, according to Ed Wayne, vice-president of research and development at Titchener.

Frame weight is cut approximately one-third, he said, and customer studies show components can be positioned on the chassis and tested 20% to 25% faster.



Shown here, at left, is the wire chassis for a Bunker-Ramo terminal. Once the components have been placed on it, the tube is added and the cabinet dropped over it to finish the assembly.

Lower cost, reduced dimensions and ease of servicing in the field are additional attributes claimed for the new systems.

"Surveys tell us applications for CRT terminals are expected to increase 300% within the next two years alone," Bob Lindridge, manager of sales, said.

"Quite frankly, with all its advantages, we expect the steel wire chassis to just about capture this market totally. This year we'll be producing some 20,000 units, and the frame's penetration of the field is only beginning," he said.

35% Savings Claimed

Raytheon is saving 35% by using the wire frame chassis instead of the solid metal version in its airlines reservations terminals, Titchener said. Bunker-Ramo (BR) reported the wire chassis is 15% less expensive and expedites assembly time by 20%. BR uses the frames in its desktop stock quotation terminal.

Hazeltine Corp., Computer Optics and Redatron Corp. are other users.

In most cases, the parts-holding chassis is manufactured of bright basic wire, 1/8-in. to 3/16-in. in diameter, and coated to afford corrosion protection and a shiny, chrome-like surface. Cold-rolled strip steel and stampings are welded onto the chassis to provide mounting studs and screw holes for holding the electronic gear.

Circuit boards are mounted with permanent fasteners or plastic snap locks which permit the boards to be popped out and replaced. The picture tube is normally bolted to four stampings with weld studs, and the power transformers affixed to a heavier stamping on the bottom of the frame for a lower center of gravity.

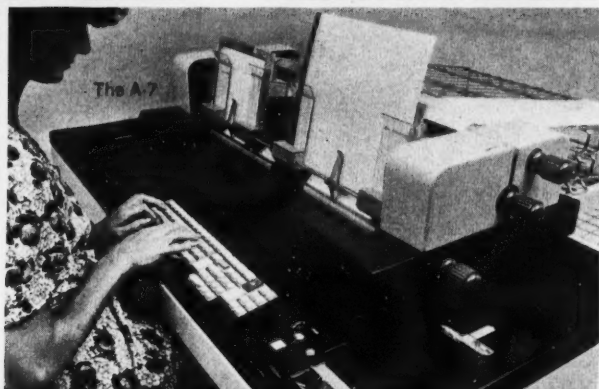
DDS Clearinghouse To Market Software For Interdata Systems

TUCSON, Ariz. — Diversified Data Systems, Inc. (DDS), a systems and software firm marketing a Cobol compiler for Interdata computers, intends to become a clearinghouse for independently written software that operates on Interdata 16-bit and 32-bit computers.

"The Interdata users group has a lot of good software available which is free to Interdata users," said Rick Dural, vice-president of marketing for DDS, "but there are many software packages written for Interdata computers whose authors are not willing to supply without charge."

"The expense of marketing a package which might sell for \$2,500 or less, however, would be prohibitive for most small companies or individuals who develop software but do not maintain marketing organizations," he said.

The authoring firm will handle the technical support of the package, should any be required.



One thing all our minicomputer systems have in common is uncommon modularity.

Our A-5 accounting system and our A-7 minicomputer as well as our TC-800 financial terminal all feature a degree of modularity that's nothing short of incredible in distributed data processing.

In each case, only the minimum basic components need be purchased. Then, as requirements increase, new modules, or peripherals, can be added on. This all but ends the expensive procedure of trading up to new and more expensive equipment while taking a painful loss on the old.

Of course, the advantages of our systems don't end with modularity.

Our A-5, for example, is designed and priced to ease small businesses into computerization.

Our A-7 minicomputer is ideal for diverse users, from wholesalers and distributors to funded organizations such as school boards and municipalities.

And our TC-800 financial terminal features its own memory. So no matter what happens to any of the computers it's tied into, the TC-800 can keep operating in an off-line mode as if nothing happened.

Is it any wonder that Olivetti is considered the most innovative maker of minicomputer systems in the world today?

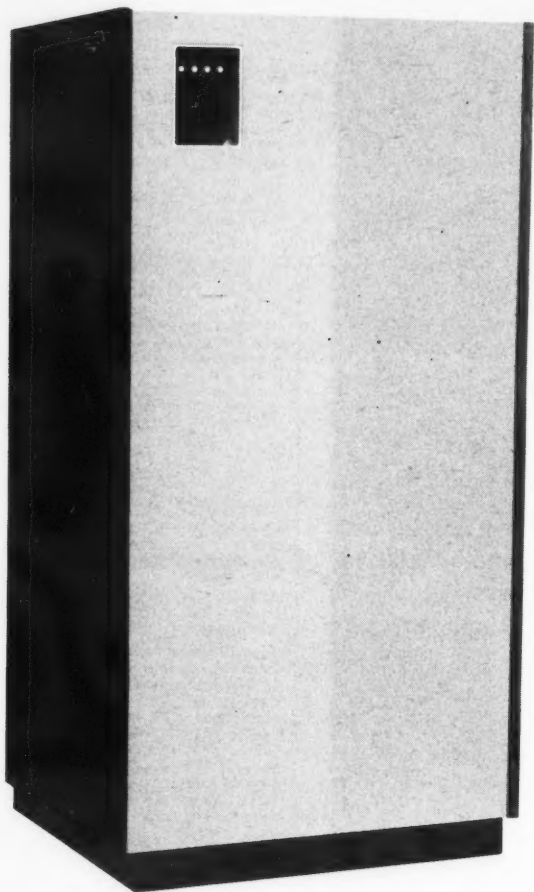
olivetti

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What Makes The IBM 3705 So Slow?



The Memorex 1380 Communications Processor!—our intelligent entry into the communications front-end marketplace. The 1380 provides throughput up to eight times that of the IBM 3705. It outperforms the

3704/3705 in network control for the same reason our 1270 is a step ahead of 2701/2/3. Memorex uses more advanced hardware and software.

The 1380's aggregate data rate is the highest available in any communications processor, consistent with the demands of today's high speed terminals. We also support a wider variety of terminals, including non-IBM.

Your freedom to control system growth is greater, too, since Memorex preserves functional compatibility with IBM 2702/3 transmission control units. You don't have to rewrite software to move into network control. Our programming includes EP, NCS (a more powerful NCP) and NCS-PEP, which interfaces to unmodified IBM communications software.

Furthermore, the 1380 has a flexible disc for program loading (independent of the CPU) and off-line testing. Our diagnostics don't interrupt processing.

Network management functions include dynamic line control, line statistics reporting, line monitoring, and down-line diagnostics via the operator CRT console. Try that on your 3705!

From memory to interfaces, more than a score of modular options are available. The memory expands from 32K bytes to 512K in 8K increments. Channel adapters for both System/360 and System/370 permit attachment to eight CPU's.

A Memorex representative can show why the 1270 and 1380 Communications Controller family is faster, more flexible and more economical.

For details, call your nearest Memorex sales office, located in major cities. Memorex Equipment Products Group, San Tomas at Central Expressway, Santa Clara, California 95052. (408) 987-1000.



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Contracts

Microdata Corp. has received a contract valued at more than \$1.4 million from Dymo Graphic Systems, Inc. for Microdata 1600 minicomputers which will be used in automatic photo-composition systems.

Systems and Computer Technology Corp. has received a four-year, \$4 million extension of an existing computer center management contract from the Illinois Board of Governors' Cooperative Computer Center.

The Kennedy Co. has been awarded a contract by Harris Communications, Inc. for 9000 series tape transports and Model 9217 formatters.

Okidata Corp. has received a contract from Lear Siegler, Inc. for 500 Okidata 110 char./sec desktop printers, which will become part of the ADM series of display terminal systems. In addition, Lear Siegler will offer maintenance services to Okidata CP110 printers in the U.S.

Uppster Readying Printer for OEMs

HAUPPAUGE, N.Y. — Uppster Corp. said it will begin deliveries of a high-speed nonimpact printer, comparable to IBM's Model 3800, to OEM customers in the U.S. as well as European Common Market countries this month.

The company's Model II xerographic-type printer, which operates at 9,200 line/min will sell in small quantities for \$38,000 per unit, according to Edward M. Brown, vice-president of marketing.

The Model II is the culmination of a five-year development

effort during which original market estimates of \$160 million were vastly increased by IBM's entry into the nonimpact printer market with the Model 3800, Wall Street market forecasters said.

Neither Brown nor Uppster's president Joseph Klockenbrink, was willing to estimate Uppster's potential share of the nonimpact printer market or the \$8.5 billion total printer market.

Foreign sales will be handled under a distribution agreement with Idac S.A., a French corporation, which calls for an irre-

vocable purchase of \$4.6 million of equipment during the initial three years of the agreement.

Mechanical assembly for the first 1,000 units is being done by Hitachi in Japan, and electronics assembly is being subcontracted to "a number of Long Island firms," Brown said.

"Original equipment manufacturers have been contacting us," Klockenbrink said. For the time being, all U.S. sales of the Model II, the company's first product, will be handled by Brown and Klockenbrink, Brown said.

The printer, which makes one copy at a time and can be set to make up to 99 copies per sheet serially, can use any size paper, but Brown expects the 8-1/2-in. by 11-in. size to be the most popular because of the rising cost of paper.

The system will be sold primarily on the basis of price/performance, Brown said.

Earnings Reports

COMPUSCAN

	1975	a1974
Shr Ernd	\$1.00	\$.68
Revenue	11,062,000	8,054,000
Tax Cred	492,000	447,000
Earnings	1,473,000	1,044,000
3 Mo Shr	.33	.28
Revenue	3,782,000	2,522,000
Tax Cred	121,000	147,000
Earnings	608,000	392,000

a-Restated.

COMTEN

	1975	1974
Shr Ernd	\$.10	\$.24
Revenue	4,642,636	3,334,905
Tax Cred	109,500	244,406
Earnings	238,288	494,966
6 Mo Shr	.12	.24
Revenue	8,174,395	5,617,280
Tax Cred	134,000	245,000
Earnings	292,139	497,532

DPF

	1975	a1974
Shr Ernd	\$1.19	.....
Revenue	25,452,000	\$31,527,000
bSpec Cred	4,481,000	1,429,000
Earnings	4,860,000	(3,365,000)
3 Mo Shr	.14	.....
Revenue	5,449,000	8,551,000
bSpec Cred	314,000	378,000
Earnings	571,000	(4,416,000)

a-Restated to conform to current reporting requirements. b-Consists of \$2.2 million gain from repurchase of debentures and a tax-loss carry-forward credit of \$2.27 million in 1975; in 1974, from a tax loss carry-forward. For the 1975 quarter, consists of a \$316,000 tax credit less a \$2,000 loss from repurchase of debentures; in 1974 quarter from repurchase of debentures.

PERTEC

	1975	1974
Shr Ernd	\$.90	\$.41
Revenue	48,016,000	32,924,000
Disc Op	.....	a(1,041,000)
Tax Cred	.....	262,000
Earnings	2,775,000	1,256,000
3 Mo Shr	.31	b.29
Revenue	13,486,000	9,451,000
Earnings	956,000	880,000

a-Includes \$406,000 loss on disposal of discontinued operations. b-Includes gain of \$.22 per share from sale of computer output microfilm operations.

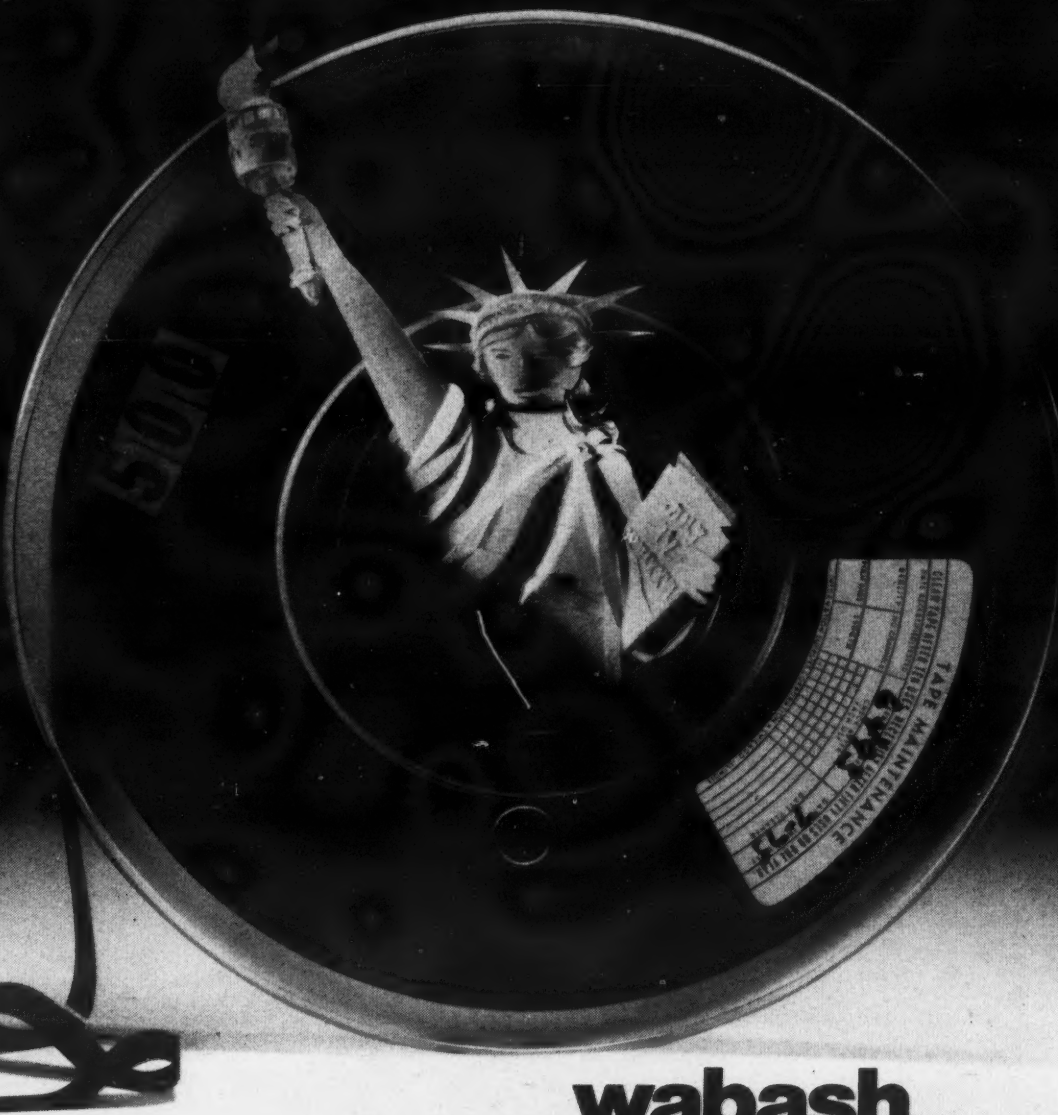
RECOGNITION EQUIPMENT

	1975	1974
Shr Ernd	\$.12	\$.40
Revenue	13,465,000	9,543,000
Tax Cred	224,000	252,000
Earnings	733,000	2,084,000
9 Mo Shr	.36	.26
Revenue	42,477,000	28,623,000
Tax Cred	965,000	949,000
Earnings	2,082,000	1,363,000

SCAN-DATA

	1975	1974
Shr Ernd	\$.04	\$.01
Revenue	2,583,726	2,497,995
Tax Cred	21,700	2,763
Earnings	67,488	12,560
6 Mo Shr	.06	.03
Revenue	5,092,934	4,426,045
Tax Cred	42,500	14,234
Earnings	107,345	43,196

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library up-date

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A.C. _____

Tel. _____

F&S Sees Law Enforcement Mart Growing to \$25 Billion by 1980

By a CW Staff Writer

NEW YORK — Spending on law enforcement equipment and programs by federal, state and local law enforcement agencies will grow from an estimated \$15 billion in 1975 to approximately \$25 billion by 1980, according to a recent Frost & Sullivan, Inc. (F&S) market research study.

The Department of Justice and its branches will pay out about \$1.9 billion and the Law Enforcement Assistance Administration (LEAA) will spend about \$886 million, the report said. Most of the latter is slated for state and local governments.

Within the Department of Justice, the Federal Bureau of Investigation is now spending about \$20 million for equipment with half of that earmarked for continuing work on automating the fingerprint system.

Bulk Goes to States

The bulk of LEAA funding, some \$480 million, will go to the states on a matching grant basis this year, according to F&S. For its own purposes, the agency is allocating \$45 million for technology analysis, development and dissemination, \$45 million for manpower development and \$26.5 million for data systems and statistical assistance.

The study theorized that the annual funding for LEAA will continue at the \$1 billion level for the next five years because of the emphasis on reducing the time gap between arrest and trial. Closing the gap will require the use of automated information systems for such activities as recordkeeping and case and jury selection.

Ibfi Program Studies Forms, Hardware Link

ARLINGTON, Va. — International Business Forms Industries (Ibfi) has instituted a technical council program to enable manufacturers of forms-using hardware — particularly printers and scanners — to become affiliated with Ibfi for an exchange of mutually relevant technical information.

Examples of the proposed services include work on image quality standards, furnishing representative test forms, calibration of optical character recognition (OCR) testing devices and forms technology orientation as well as seminars on forms technology, according to Ted Webster, Ibfi technical director.

Webster also discussed the expansion of forms standards through the American National Standards Institute as a response to the lack of American standards in the area of forms.

The feasibility of setting up a new Ansi committee under the sponsorship of Ibfi is being studied, he said.

Ibfi is at 1730 North Lynn St., 22209.

Bubble Patent Granted

YORKTOWN HEIGHTS, N.Y. — Dr. John C. Slonczewski of the IBM Research Center here has received a patent for a technique allowing higher storage density of magnetic bubbles.

In the technique, information is represented by the properties of the domain wall between the bubble and the surrounding magnetic film, rather than by the presence or absence of a bubble.

Slonczewski has devised a way of distinguishing among the different number of turns a magnetic direction makes in one closed path around a bubble, which represents the information stored.

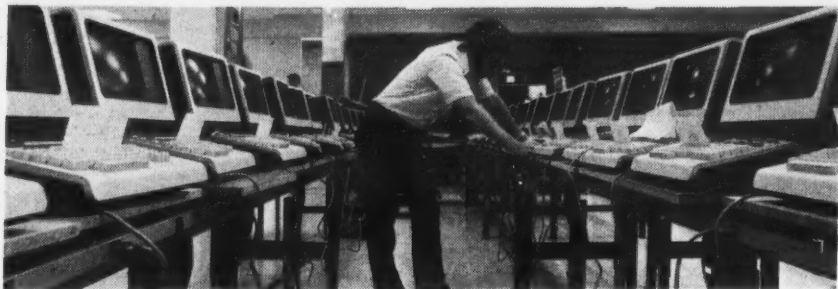
Other IBM researchers are experimenting with the concept to see if it can be developed into the basis for practical computer memories.

The report also called for special attention to information and communications exchanges among state and local agencies.

There is greater need for research into existing criminal justice systems at state and local levels, particularly into a system's needs and the size of state and local crime problems, the report said.

In addition, law enforcement agencies need more and better information on the types of crimes committed, classification of those arrested, effects of pretrial release and detention and other factors affecting the judicial process, F&S said.

The report suggested researchers explore the existing criminal justice process to develop new crime reduction methods and engineering developments from defense and aerospace industries be studied for adaptation to criminal justice use.



Lining Up for Inspection

CUPERTINO, Calif. — HP-2640 CRTs undergo reliability tests at the Hewlett-Packard Co. plant here as technician Robert Melanson verifies a test program. Over 1,000 units have been delivered since shipments began in January, leading to formation of the Terminal Products Division.

DP Directory to List Buyers, Sellers

FRAMINGHAM, Mass. — For those wanting to exchange computer equipment without going through a broker, The Computer Store, Inc. is preparing the *Computer Equipment Directory*.

The directory, which is scheduled to appear monthly, has a subscription rate of \$75 a year. Ads are free.

Computer Store may be reached through P.O. Box 2621, 01701.

Computer Design magazine announces CompDesign 76, a unique, new national supermarket of OEM products, services and information.

CompDesign 76 is a series of OEM product supermarkets that will appear in five cities across the country in conjunction with The 1976 Computer Caravan. Adapting the proven success formula of The Computer Caravan and sharing its facilities, CompDesign 76 will be a self-contained show with Designer Forums, Product Seminars and a complete Exhibition of the latest products and services in The OEM market. It will bring thousands of OEM buyers and sellers together in a unique, information-oriented atmosphere designed for serious business. And it will cover key markets across the country.

Here's the schedule:

Boston	March 2-4, 1976
New York	March 9-11
Chicago	April 13-15
Los Angeles	May 4-6
San Francisco	May 11-13

As a user of OEM products and services, you'll find CompDesign 76 to be the most efficient way possible to get detailed information on the latest developments in the industry. You'll exchange information with your peers at our Designer Forums, gather details at exhibitor product seminars, and compare equipment from a variety of companies on our exhibit floor. We'll be sending you complete details and registration forms well in advance of the show.

As an OEM marketer, you'll find that it's surprisingly easy to become an exhibitor in CompDesign 76, because our show manager, The Conference Company, does much of the work for you. They provide a standard booth or display stand, furniture, set-up and tear-down, transportation from city to city, help with your product seminars, all registration procedures — and much more. So it's possible for even the smallest companies to join with industry leaders in effective presentation of their products and services to the industry's decision makers. And the cost can be quite reasonable.

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The preferred material for publication in *Computerworld* is camera-ready art, including right-reading, emulsion-down film negatives, paste-up mechanicals and glossy stats. Plates and mats cannot be accepted.

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We'll set your ad for you in the fonts we have available at no extra charge. To lay out your ad, just follow the guidelines given below. Ads received without lay-outs will receive the best judgment of the Advertising staff. Ads set up and not used will be billed at cost for composition.

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- **Headline** — the maximum number of headline characters that will fit per column line is 18.
- **Copy** — 50 words is the maximum amount of justified copy that will fit per column inch of depth or width.
- **Company Signature** — remember that logos require white space. Your company name, address and telephone number will fit on 4 or 5 lines if small type is used.

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Computerworld is published weekly dated Wednesdays, and the closing date for each issue (excepting holidays) falls on the Friday 12 days prior to issue date.

To place your ad:

Send your copy, issue date, size, and section desired, along with your check for the full amount (we must have payment in advance from first-time advertisers) to: Debra Franchi, Classified Advertising, *Computerworld*, 797 Washington St., Newton, MA 02160. For further information, or a complete rate card, call Debra at (617) 965-5800.

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20 Manufacturer (other)
30 DP Service Bureau/Software/Planning/Consulting
40 Public Utility/Communication Systems/Transportation
50 Wholesale/Retail Trade
60 Finance/Insurance/Real Estate
70 Mining/Construction/Petroleum/ Refining
75 Business Service (except DP)
80 Education/Medicine/Law
85 Government - Federal/State/Local
90 Printing/Publishing/ Other Communication Service
95 Other:

TITLE/OCCUPATION/FUNCTION

- 11 President/Owner/Partner/General Manager
12 VP/Assistant VP
13 Treasurer/Controller/Finance Officer
21 Director/Manager of Operation/Planning/
Administrative Service
22 Director/Manager/Supervisor DP
23 Systems Manager/Systems Analyst
31 Manager/Supervisor Programming
32 Programmer/Methods Analyst
41 Application Engineer
42 Other Engineering
51 Mfg Sales Representative
52 Other Sales/Marketing
60 Consultant
70 Lawyer/Accountant
80 Librarian/Educator/Student
90 Other:



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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

position announcements

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position announcements

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Aims Community College, a comprehensive open door community college, is seeking a programmer with the following minimum qualifications: Bachelors Degree; one year of full-time programming experience in Cobol or IBM 360/370 Assembler language; and a working knowledge of BTAM or WESTI and DOS JCL. Experience at an institution of higher education is highly desirable. Salary \$10,600-\$14,600 depending upon qualifications. Applications and resumes should be submitted by September 26, 1975, to affirmative action office, Aims Community College, Box 69, Greeley, Colorado 80631. An equal opportunity employer.

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position announcements

APPLICATIONS PROGRAMMER

Oberlin College is seeking applicants for the position of Applications Programmer to: act as technical liaison and resource person for students and faculty using the Computing Center which operates a Xerox Sigma 9 computer using several programming languages and with heavy emphasis on time sharing; develop new or enhance existing computer programs. The opportunity to teach on a part-time basis may be available. Qualifications: B.A., or equivalent, plus one year of relevant experience. Advanced degree, or equivalent, preferred with more than one year of relevant experience. Familiarity with applied statistical and numerical analysis is required. While the emphasis will be in social and behavioral science, applicants with experience in the natural sciences will be considered. Experience with commonly used statistical packages (e.g. SPSS, BMD, MINITAB) is desirable. Resumes should be sent by October 1, 1975 to Don Mittleman, Computing Center, Oberlin College, Oberlin, Ohio, 44074. The position is to be filled by approximately November 15, 1975 at an annual salary range of \$12,000 to \$15,000, depending on experience and qualifications. Affirmative action/equal opportunity employer.

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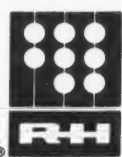
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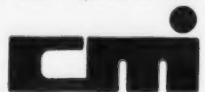


position announcements

IBM SYSTEMS PROFESSIONALS

We are seeking a Systems Professional experienced in DOS/VS, OS/VS1, OS/VS2, or VM/370 internals; DASD programming; and System Utilities to take charge of a challenging program to develop and test IBM-compatible processing hardware systems. If you are this person, or know of such a person, please contact us by telephone or resume for a confidential discussion of your qualifications. If you are the right person, you can expect attractive compensation, and the opportunity to be responsible for state-of-the-art hardware systems.

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position announcements

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position announcements

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Immediate opening for Associate Director of Data Processing at progressive community college. Position is responsible for marketing data processing services to the College and external user, general management of the computer center facilities and its staff, and general management of systems programming. Position reports to the Director. Prime requisites are marketing of D.P. services and management of D.P. center. DOS/VS systems programming a plus. Bachelors degree required, MBA an asset. Excellent fringe benefits including 20 days vacation. Starting salary commensurate with experience. Send resume and salary history by September 5, 1975, to:

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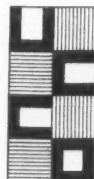
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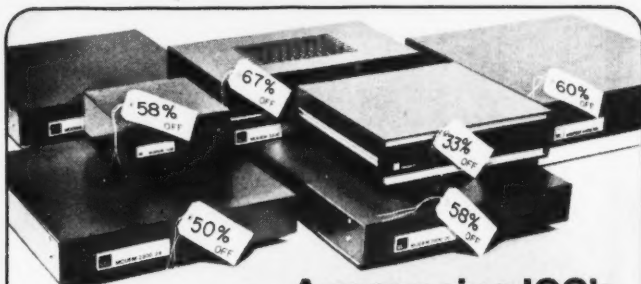
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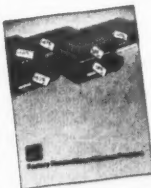
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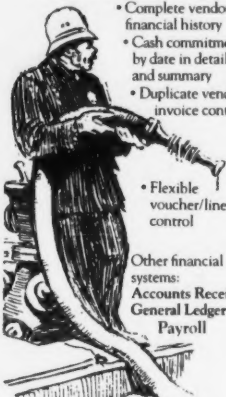
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Datran Factor in \$12 Million Half-Year Loss at Wyly

DALLAS — Cash-hungry Wyly Corp. reported a second-quarter loss of \$9.5 million and a \$12 million loss for the six months ended June 30.

The losses were due primarily to underwriting losses in its insurance subsidiary and operating losses from its Data Transmission Co. (Datran) subsidiary.

Wyly has been attempting to sell its Gulf Insurance subsidiary and said it anticipates such a sale could result in a net loss of \$20 million or more and a substantial reduction in debt.

Discussions are continuing with

Haefner Holding AG on a possible substantial investment in Wyly stock, the firm said. Haefner has been supplying Datran with interim loans which are expected to satisfy Datran's cash requirements for 1975.

Datran will need additional cash during 1976, which has not yet been arranged, Wyly said.

Wyly changed its accounting methods to conform to new standards for development-stage companies. Datran's operating and other costs, previously deferred, are shown as losses. Wyly's investment in the firm

and its shareholder equity were also restated.

The figures for 1974 were also restated to reflect the sale of the Computer Leasing Co., subsidiary and the Energy Division of University Computing Co. (UCC).

Breaking down the quarter, Wyly's consolidated revenues declined to \$15.5 million from \$21.1 million in the same period last year. The loss grew to \$9.5 million or \$1.14 a share including a \$2.4 million credit from discontinued operations, compared with a loss of \$1.8 million or 22 cents a share in the 1974 quarter, which included a \$535,000 credit from discontinued operations.

UCC's service operations' income before taxes and corporate costs declined to \$1.1 million compared with \$2.8 million in the year-ago quarter, while Gulf Insurance lost \$6.2 million compared with a \$861,000 loss in the 1974 quarter.

Datran contributed a loss of \$3 million compared with a \$1.5 million loss before taxes and corporate costs in the year-ago period.

Datran's unconsolidated revenues, however, grew to \$131,000 in the quarter from \$19,000 in the same 1974 period.

Same Picture

During the six months, the picture was much the same.

Consolidated revenues declined to \$31 million from \$39.9 million in the year-ago and losses grew to \$12 million or \$1.45 a share, including a \$2.8 million credit from discontinued operations.

The loss in the 1974 six months, when there was a \$975,000 credit, was \$2.4 million or 29 cents a share.

Gulf Insurance lost nearly \$6 million in contrast with earnings of \$1.9 million in the 1974 half, while Datran showed a deficit of \$5.5 million before taxes and costs. A year ago the restated Datran debit was \$3.3 million.

UCC Figures

UCC's six-month pretax income totaled \$2.8 million com-

pared with \$3.7 million in the year-ago half. The 1974 figure included a \$1.5 million sale of software to a single customer and profits of \$800,000 on a services contract later sold.

UCC revenues for the first half of 1975 totaled \$30.8 million from continuing operations.

There was a \$2.8 million gain from the sale of three UCC operating units, a service center in Seattle, a custom programming operation in Pennsylvania and its energy group.

"A decision to increase banking product development and to accelerate our scientific/engineering equipment consolidation program is reducing earnings in the first half," Donald G. Thomson, UCC president said.

"But this is expected to produce revenue and profits in 1976, offsetting the loss of profits from those entities sold," he added.

All UCC divisions were profitable at midyear, although the

Scientific and Engineering Division experienced significant revenue erosion in the second quarter and the Banking Division reported a loss for that three-month period, he said.

The UCC Commercial Division continued to exceed revenue and profit goals and the Financial Software Group achieved its financial objectives in the first half, he said.

The UCC Scientific and Engineering Division's revenue declined in the early summer months largely because of general economic depression and a resulting decrease in outside procession by clients.

The UCC Banking Division's progress in the first six months showed distinct improvement over the same period a year ago. A program is now under way to develop and market several new banking products to keep this division abreast of trends toward on-line processing, Thomson said.

Net Rises at Decision Data

HORSHAM, Pa. — Despite a sharp drop in second-quarter earnings, Decision Data Computer Corp. managed to show an increase in earnings during the six months ended May 31.

President Loren A. Schultz attributed the second-quarter decline to general economic conditions and especially to the lower order rate experienced in the first quarter.

The original equipment manufacturers (OEM) are deferring decisions on equipment, and a record level of end-user orders was not sufficient to offset the reduced OEM activity, he said.

Deliveries of new products announced in May will begin in the third quarter, he added.

During the quarter, the firm earned \$68,000 or 2 cents a share, reflecting a tax credit of \$99,000. This compares with earnings of \$270,000 or 7 cents a share in the year-ago period, when there was a \$128,000 credit.

Revenues grew to \$11.2 million compared with \$9.9 million in the 1974 quarter.

For the six months, however, earnings rose to \$493,000 or 13 cents a share compared with \$411,000 or 11 cents a share. The credits were \$261,000 and \$194,000 respectively.

Revenues during the half expanded to \$22.8 million compared with \$17.2 million a year ago.

Scan-Data Results Up in 6 Months

NORRISTOWN, Pa. — Scan-Data Corp.'s earnings and revenues increased for the second-quarter and six-month periods ended June 30.

Earnings for the quarter jumped to \$67,488 or 4 cents a share compared with \$12,560 or 1 cent a share in the same period last year. Tax credits for 1975 totaled \$21,700 compared with \$2,763 in the year-ago quarter.

\$2.6 Million Revenues

Revenues rose to \$2.6 million compared with \$2.5 million in the same 1974 quarter.

In the six months, earnings grew to \$107,345 or 6 cents a share including a \$42,500 tax credit compared with \$43,196 or 3 cents a share, including a \$14,234 credit, in the year-ago period.

Revenues totaled \$5.1 million compared with \$4.4 million in the same period last year.

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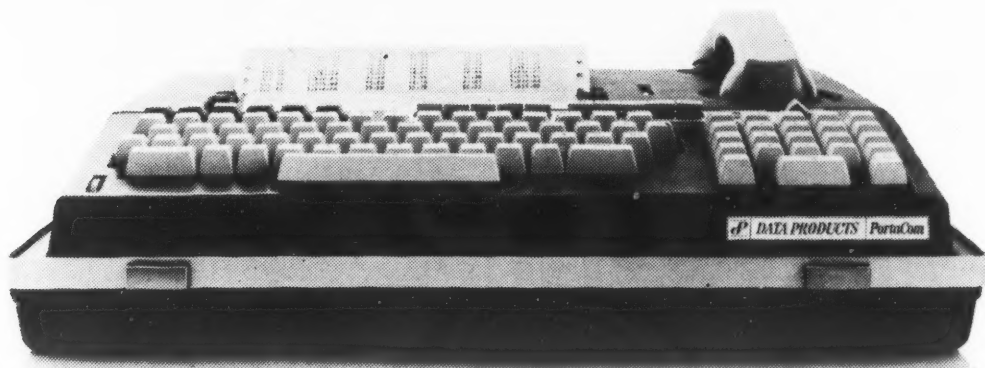
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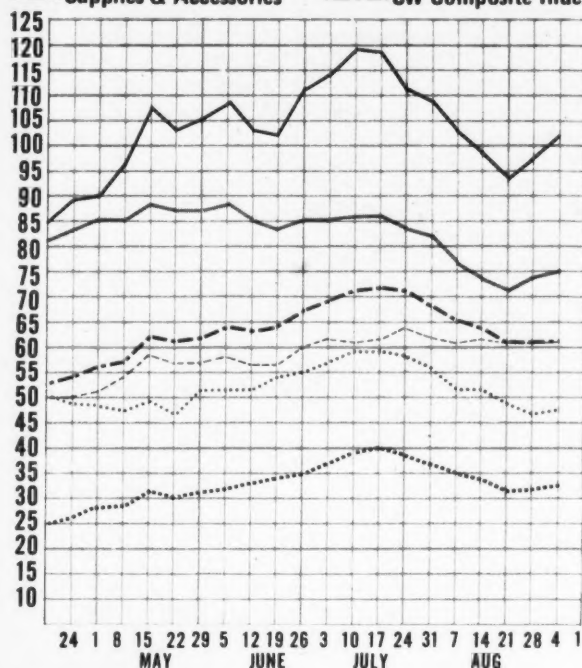
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Earnings Reports

DIGITAL EQUIPMENT Year Ended June 28			MANAGEMENT ASSISTANCE Three Months Ended June 30			GREYHOUND COMPUTER Three Months Ended June 30		
1975	1974		1975	1974		1975	1974	
Shr Ernd	3.85	3.80	Shr Ernd	\$0.07	\$0.04	Shr Ernd	\$0.02	\$0.07
Revenue	533,774,000	421,884,000	Revenue	24,272,000	19,996,000	Revenue	15,338,000	13,675,000
Earnings	46,000,000	44,400,000	*Tax Cred	818,000	652,000	Earnings	91,000	308,000
3 Mo Shr	1.46	1.36	Earnings	1,940,000	1,151,000	6 Mo Shr	.03	.17
Revenue	160,542,000	135,199,000	9 Mo Shr	.14	.06	Revenue	31,170,000	26,469,000
Earnings	17,420,000	15,981,000	Revenue	69,067,000	55,855,000	Earnings	140,000	746,000
			aSpec Cred	928,000	1,126,000	a-Includes results of Computer Leasing Co. from purchase date of Dec. 31, 1974.		
			Earnings	4,068,000	1,663,000			
			a-Consists of \$592,000 loss from write-off of settlement agreement and a gain of \$1.5 million from tax-loss carryforward in 1975; in 1974, from tax-loss carryforward.					

COMPUTERWORLD Computer Stocks Trading Indexes

— Computer Systems
 Peripherals & Subsystems
 - - - - - Supplies & Accessories
 - - - - - Software & EDP Services
 Leasing Companies
 - - - - - CW Composite Index



HAZELTINE Three Months Ended June 30		
1975	1974	
Shr Ernd	.....	\$0.03
Revenue	\$21,278,000	22,670,000
Earnings	(325,000)	64,000
6 Mo Shr	.....	.10
Revenue	38,306,000	50,904,000
Spec Chg	.....	6680,000
Loss	1,365,000	494,000
a-Restated. b-Cumulative effect of accounting change.		

MILGO ELECTRONIC Three Months Ended June 30		
1975	1974	
Shr Ernd	\$0.51	\$5.44
Revenue	8,868,000	8,950,000
Earnings	861,000	734,000
9 Mo Shr	1.94	11.28
Revenue	29,419,000	22,579,000
Earnings	3,255,000	2,118,000
a-Adjusted for 5% stock dividend in February 1975.		

SIEMENS AG aNine Months Ended June 30		
1975	1974	
Revenue	\$5,100,200	\$4,672,900
Earnings	135,900	133,600
a-The above figures have been computed at the mark's current rate.		

SINGER Three Months Ended June 30		
1975	1974	
Shr Ernd	.....	\$0.80
Revenue	\$628,550	650,182
Disc Op	.....	(2,757)
Earnings	1,129	15,138
6 Mo Shr	.....	1.68
Revenue	1,293,614	1,292,578
Disc Op	.....	(5,992)
Earnings	(2,566)	31,815
a-No common share earnings shown; preferred dividend requirements exceeded net income.		

Computerworld Sales Offices

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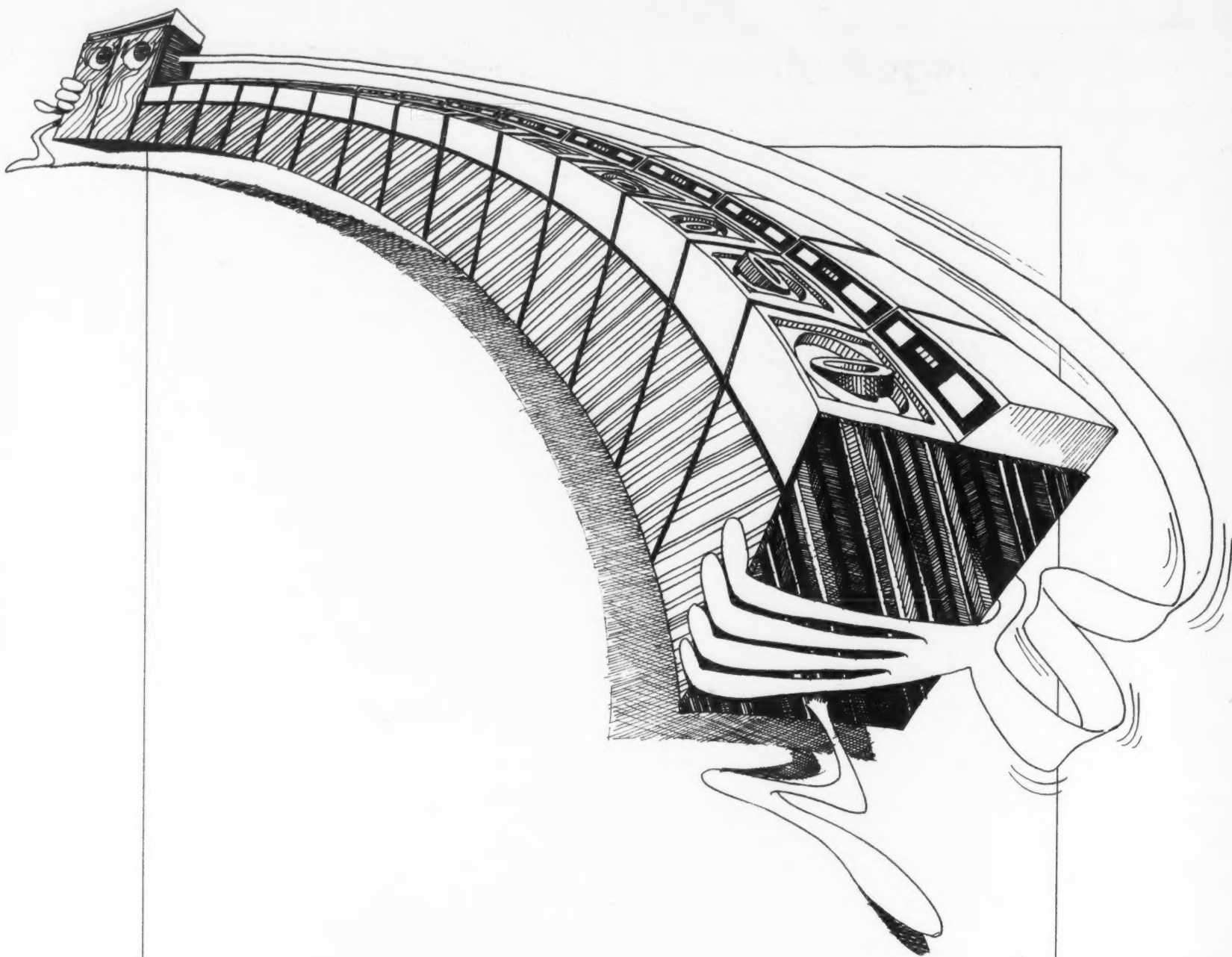
Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, SEPTEMBER 3, 1975

 All statistics compiled,
 computed and formatted by
 TRADE*QUOTES, INC.
 Cambridge, Mass. 02139

PRICE					PRICE					PRICE				
1975	CLOSE	WEEK	WEEK		1975	CLOSE	WEEK	WEEK		1975	CLOSE	WEEK	WEEK	
RANGE	SEP 3	NET	PCT		RANGE	SEP 3	NET	PCT		RANGE	SEP 3	NET	PCT	
(1)	1975	CHNGE	CHNGE		(1)	1975	CHNGE	CHNGE		(1)	1975	CHNGE	CHNGE	
COMPUTER SYSTEMS														
N BURROUGHS CORP	67-109	90 3/4	+2 1/8	+2.3	N ADVANCED COMP TECH	1-1	1	0	0.0	N DATA ACCESS SYSTEMS	1-3	2	0	0.0
N COMPUTER AUTOMATION	2-10	8 5/8	+5/8	+7.8	A APPLIED DATA RES.	1-10	1 3/4	0	0.0	N DATA 100	5-16	9 3/4	+3/8	+4.0
N CENTRAL DATA CORP	11-23	17	+3/4	+4.6	N AUTOMATIC DATA PROC	29-65	52 3/8	+3/4	+1.4	A DATA PRODUCTS CORP	2-6	3 1/2	-1/8	-3.4
N DATA GENERAL CORP	10-38	29	+1 3/4	+6.4	N BRANDEN APPLIED SYST	1-1	1/8	-1/8	-50.0	N DATA TECHNOLOGY	1-3	1 7/8	+1/8	+7.1
N DATACONT CORP	6-26	20 3/4	+3	+16.9	N CENTRAL DATA SYSTEMS	3-7	6 5/8	+1/8	+1.9	N DATUM INC	1-2	1 3/8	0	0.0
N DIGITAL COMP CONTROL	1-4	3 1/2	+1/4	+7.6	N COMPUTER DIMENSIONS	2-6	4	0	0.0	N DECISION DATA COMPUT	4-7	4 7/8	+1/8	+2.6
N DIGITAL EQUIPMENT	46-122	113 5/8	+3	+2.7	N COMP ELECTION SYSTEMS	3-6	5 1/2	+1/4	+6.7	N DELTA DATA SYSTEMS	1-1	1/4	0	0.0
N ELECTRONIC ASSOC.	2-3	2 1/2	+1/8	+5.2	N COMPUTER HORIZONS	1-1	3/4	0	0.0	N DIAN CONTROLS	1-1	3/4	0	0.0
N ELECTRONIC ENGINEER.	5-10	8 3/4	+1/8	+1.4	N COMPUTER NETWORK	1-3	2 1/4	-1/8	-5.2	N ELECTRONIC M & M	1-3	1 3/4	0	0.0
N EXPORD	23-42	30	-3/4	-2.4	N COMPUTER SCIENCES	2-6	5 1/4	+3/4	+16.6	N FAIRCHILD	1-1	1	0	0.0
N GENERAL AUTOMATION	6-14	8 1/8	+1 1/4	+18.1	N COMPUTER TASK GROUP	1-1	5/8	0	0.0	N GENERAL COMPUTER SYS	1-2	1 1/4	0	0.0
N GRI COMPUTER CORP	1-1	5/8	0	0.0	N COMPUTER USAGE	2-4	2 1/4	-1/8	-5.2	N HAZELTINE CORP	3-6	3 3/4	-1/4	-6.2
N HEWLETT-PACKARD CO	58-120	91 3/8	-1 1/8	-1.2	N COKSHAF	3-4	2 7/8	+1/8	+6.5	N HARRIS CORP	18-28	24	+1	+4.3
N HENESWELL INC	22-43	30	+1 7/8	+6.6	N DATAR	1-2	1 5/8	-1/8	-7.1	A INCOTERM CORP	3-12	9 3/4	+5/8	+6.8
N IBM	158-224	182 3/4	+1 3/4	+0.9	N ELECTRIC COMP PROG	1-1	1/4	0	0.0	N INCFEX INC	2-5	2 7/8	0	0.0
N MICRODATA CORP	1-10	7 1/4	+1/4	+3.5	N ELECTRONIC DATA SYS.	12-29	17 3/4	-1/2	-2.7	N INFORMATIONAL INTL INC	8-14	10	-1 3/4	-14.3
N MODULAR COMPUTER SYS	5-19	12 1/4	+1 3/4	+16.6	N INTERNATIONAL INC	1-1	3/4	0	0.0	N LUNCEY ELECTRONICS	3-3	7 7/8	0	0.0
N NCR	15-39	28 1/4	+1 3/8	+5.1	N IPS COMPUTER MARKET.	2-3	2 1/4	0	0.0	N MANAGEMENT ASSIST	1-1	1/2	-1/8	-20.0
N PRIME COMPUTER INC	2-6	5 1/4	+1/4	+5.0	N KFAE ASSOCIATES	2-3	2 1/2	0	0.0	A MILGO ELECTRONICS	8-24	17	+1 3/8	+8.7
N PERKIN-ELMER	16-30	24 1/2	+1	+4.2	N KEYDATA CORP	2-3	2 1/2	0	0.0	N MCHAM DATA SCI	1-5	3 1/4	+3/8	+13.0
N PAYTHORN CO	26-59	51 3/4	+2	+4.0	N LOGICON	3-5	3 3/4	+1/8	+3.4	N OPTICAL SCANNING	1-3	3	0	0.0
N SINGER COMPANY	10-17	12 1/2	+1/4	+2.0	A MANAGEMENT DATA	1-3	1 7/8	+1/8	+7.1	N PERTEL CORP	2-2	1 3/8	-1/8	-8.3
N SERRA RAND	26-49	35 3/4	-1/2	-1.2	N NATIONAL CSS INC	6-14	12 3/4	+3/4	+6.2	N PERTEC CORP	2-8	4 7/8	+1/8	+2.6
A SYSTEMS ENG. LABS	1-5	3 3/8	+1/4	+8.0	N NATIONAL COMPUTER CC	1-1	1/8	0	0.0	A PETER INSTRUMENT	2-2	1 3/4	0	0.0
N ULTIMATE SYSTEMS INC	1-6	5 5/8	0	0.0	A LN LINE SYSTEMS INC	8-17	13 3/4	+1/2	+3.7	N PRECISION INST.	1-1	3/4	0	0.0
N VARIAN ASSOCIATES	7-18	14 3/8	+1	+7.4	N PLANNING RESEARCH	2-6	4	+1/8	+3.2	N QUANTAR CORP	2-6	5 1/8	+1/2	+10.8
N WANG LABS.	7-17	12	+1/4	+2.1	N PROGRAMMING & SYS	1-1	5/8	0	0.0	N RECOGNITION EQUIP	2-9	6 3/8	+1/4	+4.3
N XEROX CORP	51-86	56 7/8	-1 1/8	-1.9	N RAPIDATA INC	2-5	3 7/8	+1/4	+6.8	N SANDERS ASSOCIATES	3-11	7 3/8	+1/2	+7.2
LEASING COMPANIES														
A COMDISCO INC	1-5	3 3/8	0	0.0	N REYNOLDS & REYNOLD	10-24	11	0	0.0	N SCAN DATA	1-3	1 7/8	+1/8	+7.1
A COMMERCE GROUP CORP	2-4	3	0	0.0	N SCIENTIFIC COMPUTERS	1-1	1	0	0.0	N STORACE TECHNOLOGY	6-17	13 3/8	+1 1/8	+9.1
A COMPUTER INVSYS GRP	1-2	5/8	-	-8.2	N SIMPLICITY COMPUTER	1-1	7/8	+1/8	+16.6	N SYCOR INC	5-15	13 1/2	-1/4	-1.8
A PATRONIC RENTAL	1-1	1/2	0	0.0	N TYPHAK INC	7-21	19 1/8	+2 3/4	+16.7	N T BAR INC	3-6	5 1/2	+1/8	+2.3
A CCL INC	1-1	1/2	0	0.0	A URS SYSTEMS	2-4	3 1/8	+1/8	+4.1	N TALLY CORP.	1-5	3 1/4	+1/8	+4.0
N DPE INC	3-6	4 3/4	+1/4	+5.5	N WLY CORP	2-4	3	0	0.0	N TEC INC	1-4	2 3/4	-1/4	-8.3
N EUC RESOURCES	1-2	1	0	0.0	PERIPHERALS & SUBSYSTEMS									
A GRANITE MPT	1-5	3 3/4	+1/4	+7.1	N ADRESSOGRAPH-MULT	4-9	6 7/8	+3/8	+5.7	N BALTIMORE BUS FORMS	4-5	4 1/2	0	0.0
A GRYVCOMF COMPUTER	2-3	2 7/8	0	0.0	N ADVANCE MEMORY SYS	1-7	4 1/2	+1/2	+12.5	A BARRY WRIGHT	5-7	6 1/2	+1/4	+4.0
A ITEL	3-9	6 1/8	+1/4	+6.2	N AMPEX CORP	3-7	5 1/2	+3/8	+7.3	N CYBERMATICS INC	1-1	1/2	0	0.0
N LEASCO CORP	4-8	5 5/8	-3/8	-6.2	N ANDERSON JACOBSON	1-3	2 1/4	+3/8	+20.0	A DATA DOCUMENTS INC	29-42	33 7/8	-1/8	-0.3
N LEASPCORP	1-1	1/4	0	0.0	A ROLY, PERANEX & NEW	5-13	10 3/8	+3/8	+3.7	N COMPLEX PRODUCTS INC	12-25	16 5/8	+5/8	+3.9
N LECTRA MPT INC	1-1	1/8	0	0.0	N PUNKER-RAMC	4-8	4 5/8	0	0.0	N EANTS BUS. FORMS	5-7	5 1/4	+1/8	+2.4
N NRG INC	1-4	2 3/8	0	0.0	A CALCOMP	4-7	4	0	0.0	N GRAHAM MAGNETICS	5-10	8 1/4	0	0.0
A PICKNER TEX CORP	2-7	4 3/4	-1/4	-5.0	N CAMBRIDGE MEMORIES	3-5	3 3/4	0	0.0	N GRAPHIC CONTROLS	8-21	12 1/4	+3/4	+6.5
A ROCKWELL COMPUTER	1-1	1/4	0	0.0	N CENTRONICS DATA COMP	7-25	16	+3/4	+4.9	N 3M COMPANY	43-68	54 5/8	+7/8	+1.6
N U.S. LEASING	8-14	7 7/8	-1	-11.2	N CCEX CORP	15-38	33 1/2	+4 1/4	+14.5	J MICRO CORP LTD	39-51	44 3/4	+1	+2.2
SUPPLIES & ACCESSORIES														
N BALTIMORE BUS FORMS	4-5	4 1/2	0	0.0	N CGGATRONICS	1-2	1	-1/8	-11.1	N NASHUA CORP	11-22	12 5/8	+3/8	+3.0
A BARRY WRIGHT	5-7	6 1/2	+1/4	+4.0	N COMPUTER COMMUN.	1-2	1	0	0.0	N STANDARD REGISTER	11-20	16 1/4	+1/2	+3.1
N CYBERMATICS INC	1-1	1/2	0	0.0	N COMPUTER CONSOLES	3-7	3 3/4	-1/2	-11.7	N TAB PRODUCTS CO	4-8	5 3/4	0	0.0
A DATA DOCUMENTS INC	29-42	33 7/8	-1/8	-0.3	A COMPUTER EQUIPMENT	1-2	1 5/8	-1/8	-7.1	N UARCE	17-24	19 5/8	-1/8	-0.6
N COMPLEX PRODUCTS INC	12-25	16 5/8	+5/8	+3.9	N COMPUTER MACHINERY	1-2	1 1/2	-1/4	-14.2	N VANIER GRAPHICS CORP	4-7	4 3/4	0	0.0
N EANTS BUS. FORMS	5-7	5 1/4	+1/8	+2.4	N COMPUTER TRANSCIVER	1-2	1 1/8	0	0.0	A WADASH MAGNETICS	3-5	4 1/8	+1/8	+3.1
N GRAHAM MAGNETICS	5-10	8 1/4	0	0.0	N CMEN	2-5	3 1/2	0	0.0	N WALLACE BUS FORMS	15-25	17	-1 1/8	-6.2
N GRAPHIC CONTROLS	8-21	12 1/4	+3/4	+6.5	N CCARAC CORP	12-23	17 3/4	+2 5/8	+17.3					

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